CALIFORNIA HIGH-SPEED TRAIN

Project Environmental Impact Report/Environmental Impact Statement

DRAFT

Bakersfield to Palmdale Section

Supplemental Alternatives Analysis Report Volume 2

February 2012

CALIFORNIA High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

APPENDIX A – DETAILED EVALUATION TABLES

Table A-1: Edison Subsection – Evaluation Matrix

Note: Key factors that distinguish among the alternatives are highlighted in yellow.

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Design Objectives					
Journey time (220 mph)	**Common to all alternatives** 3 minutes - 3 seconds				
Route length	**Common to all alternatives** Total Length: 11.2 miles				
Intermodal connections	**Common to all alternatives** Not applicable. No station location.				
Capital costs	▪ Lower costs due to a reduction in viaduct lengths as compared to Prelim AA E2B and Prelim AA E4. ▪ Extensive interchange/overcrossing reconstruction at 5 locations. Includes: ▪ 5.0 miles of elevated structure ▪ 0 UPRR Crossings ▪ 5 roadway grade separations ▪ Requires reconstruction of roadway interchanges with SR 58 at Edison Road, Comanche Drive, and Tower Line Road. ▪ Requires constructing new overcrossings at Malaga Road and Tejon Highway.	▪ Higher costs due to the extensive length of elevated structure. Includes: ▪ 11.2 miles of elevated structure ▪ 0 UPRR Crossings ▪ 0 roadway grade separations ▪ Requires reconfiguration of roadway (SR 58) ramps to accommodate HST viaduct support column placement.	▪ Lower costs due to the least amount of viaduct of all alternatives. ▪ Moderate amount of earthwork to construct alignment in shallow cut. Includes: ▪ 3.3 miles of elevated structure ▪ 0 UPRR Crossings ▪ 6 roadway grade separations ▪ Requires reconstruction of roadway interchanges with SR 58 at Edison Road, Comanche Drive, and Tower Line Road. ▪ Requires constructing new overcrossings at Vineland Road, Malaga Road, and Tejon Highway.	▪ Higher costs due to extensive length of elevated structure. Includes: ▪ 11.2 miles of elevated structure ▪ 0 UPRR Crossings ▪ 0 roadway grade separations ▪ Requires a realignment of roadway (Edison Highway) in the community of Edison.	▪ Lower costs due to a reduction in viaduct lengths as compared to Prelim AA E2B and Prelim AA E4. ▪ Moderate amount of earthwork to construct alignment in shallow cut. Includes: ▪ 4.8 miles of elevated structure ▪ 5 UPRR Crossings (grade separated) ▪ 4 UPRR Crossings (at-grade) ▪ 5 roadway grade separations ▪ Requires constructing grade separations of Edison Highway and the UPRR for Weedpatch Highway, Vineland Road, Comanche Drive, Tejon Highway, and Tower Line Road. ▪ Requires a realignment of Edison Highway through the town of Edison to accommodate the HST viaduct support columns.
Operating costs	**Common to all alternatives** Not a differentiator—operating costs across all alternatives would be very similar.				

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Maintenance costs	▪ Lowest costs. ▪ Reduced length of elevated structures. ▪ The length of elevated structure is reduced over Prelim AA E2B and Prelim AA E4, lessening long-term maintenance costs.	▪ Higher costs. ▪ The entire alignment is on elevated structure, requiring increased long-term maintenance.	▪ Lower costs. ▪ Reduced length of elevated structures. ▪ The length of elevated structure is reduced over Prelim AA E2B and Prelim AA E4, lessening long-term maintenance costs. ▪ The alignment in a shallow cut may require special drainage considerations, which could increase long-term maintenance costs.	▪ Higher costs. ▪ The entire alignment is on elevated structure, requiring increased long-term maintenance.	▪ Lower costs. ▪ Reduced length of elevated structures. ▪ The length of elevated structure is reduced over Prelim AA E2B and Prelim AA E4, lessening long-term maintenance costs. ▪ The alignment in a shallow cut may require special drainage considerations, which could increase long-term maintenance costs.
Land Use					
Potential for Transit-Oriented Development	**Common to all alternatives** Not applicable. No station location.				
Consistency with other planning efforts	**Common to all alternatives** Not a differentiator. ▪ All alternatives are generally consistent with other planning efforts, avoiding developed land uses in the community of Edison. ▪ Would replace some businesses along Edison Highway.				
Constructability					

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Constructability	▪ Moderate difficulty to construct. ▪ Extensive coordination is needed with Caltrans and County DOT is for roadway/interchange reconstruction. ▪ Within the general proximity of Edison Highway and SR 58. Construction access is readily available. ▪ Requires substantial reconstruction at SR 58 and Edison Road, Malaga Road, Comanche Drive, Tejon Highway, and Tower Line Road due to the close proximity of the HST alignment to interchange ramps. This reconstruction would include realigning existing interchange ramps, reconstructing overcrossing structures, and raising local road profiles to provide the necessary clearance over the HST. ▪ Close coordination with Caltrans would be required to ensure the Level of Service is not affected during construction, and to ensure the location would not preclude any future improvements of these interchanges.	▪ Easiest to construct. ▪ Has the least amount of roadway/highway interaction. This alternative also has the smallest footprint. ▪ Within the general proximity of Edison Highway and SR 58. Construction access is readily available. ▪ Structural supports are located within Caltrans right-of-way at the SR 58/ Edison Road/ Comanche Drive/ Tower Line Road interchanges. ▪ Close coordination with Caltrans would be required to ensure the Level of Service is not affected during construction, and to ensure the location would not preclude any future improvements of these interchanges.	▪ Moderate difficulty to construct. ▪ Extensive coordination with Caltrans and County DOT is needed for roadway/ interchange reconstruction; this alternative has the largest footprint. ▪ Within the general proximity of Edison Highway and SR 58. Construction access is readily available. ▪ Requires reconstruction at SR 58 and Edison Road, Malaga Road, Comanche Drive, Tejon Highway, and Tower Line Road due to the close proximity of the HST alignment to interchange ramps. This reconstruction would include realigning existing interchange ramps, reconstructing overcrossing structures, and raising local road profiles to provide the necessary clearance over the HST. This would require agency coordination. ▪ Requires several roadway grade separations; which would require local agency coordination, and that traffic operation is maintained during construction. ▪ Close coordination with Caltrans would be required to ensure the Level of Service is not affected during construction, and to ensure the location would not preclude any future improvements of these interchanges.	▪ More difficult to construct. ▪ More difficult than Prelim AA E2B due to the alignment passing directly through the town of Edison. ▪ Within the general proximity of Edison Highway and SR 58. Construction access is readily available. ▪ Passes through the town of Edison on viaduct. This would require a realignment of a segment of Edison Highway to avoid local road conflicts with the proposed HST alignment. Special considerations may be required to minimize residential impacts during construction.	▪ Most difficult to construct. ▪ Requires the most UPRR coordination. ▪ Within the general proximity of Edison Highway and SR 58. Construction access is readily available. ▪ Requires the most coordination with the UPRR. ▪ Requires several roadway grade separations, which would require local agency coordination; and that traffic operation is maintained during construction. ▪ Passes through the town of Edison on viaduct. This would require a realignment of a segment of Edison Highway to avoid local road conflicts with the proposed HST alignment. Special considerations may be required to minimize residential impacts during construction.
Disruption to existing railroads	▪ Low impact. ▪ Construction of grade separation over spur crossing (between Fairfax Road and Weedpatch Highway) would be done such as to minimize disruptions during construction.				▪ Moderate impact. ▪ Construction of grade separation over spur crossing (between Fairfax Road and Weedpatch Highway) would be done such as to minimize disruptions during construction. ▪ Creates 5 new roadway grade separations of the UPRR. (Weedpatch Highway, Vineland Road, Comanche Drive, Tejon Highway, and Tower Line Road). ▪ Creates 4 new roadway at-grade crossings with the UPRR.

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Disruption to and relocation of utilities	Crossings: ▪ 7 natural gas lines ▪ 9 electric transmission lines		Crossings: ▪ 6 natural gas lines ▪ 9 electric transmission lines		Crossings: ▪ 5 natural gas lines ▪ 9 electric transmission lines
Disruption to Communities					
ROW Acquisition/ Displacement Parcels crossed (Acres affected)	▪ 31 agricultural parcels (157 acres) ▪ 15 residential parcels (5 acres) ▪ 27 commercial parcels (10 acres) ▪ 45 industrial parcels (47 acres)		▪ 31 agricultural parcels (155 acres) ▪ 15 residential parcels (6 acres) ▪ 26 commercial parcels (10 acres) ▪ 45 industrial parcels (49 acres) ▪ 4 public parcels (3 acres)	▪ 22 agricultural parcels (80 acres) ▪ 20 residential parcels (5 acres) ▪ 41 commercial parcels (12 acres) ▪ 50 industrial parcels (38 acres)	▪ 22agricultural parcels (104 acres) ▪ 19 residential parcels (6 acres) ▪ 39 commercial parcels (14 acres) ▪ 51 industrial parcels (48 acres) ▪ 7 public parcels (7 acres)
Properties with access affected	▪ Low impact. ▪ Partially elevated profile with at-grade portion (between Vineland Road and Tower Line Road) is aligned as close as possible to parallel highway (SR 58) to minimize impacts on property. ▪ Partial right-of-way take between HST and SR 58 would not sever or impact existing north-south and local road access to properties.	▪ Low impact. ▪ Entirely elevated profile reduces potential access disruption. Column placement considerations would take into account minimizing impacts to property access and land uses.	▪ Low impact. ▪ Partially elevated profile with at-grade portion (between Weedpatch Highway and Tower Line Road) is aligned as close as possible to parallel highway (SR 58) to minimize impacts on property. ▪ Partial right-of-way take between HST and SR 58 would not sever or impact existing north-south and local road access to properties.	▪ Low impact. ▪ Entirely elevated profile reduces potential access disruption. Column placement considerations would take into account minimizing impact to property access and land uses. ▪ Requires realignment of Edison Highway through the town of Edison to accommodate the HST viaduct. This would potentially affect trucking access to several industrial parcels in this area.	▪ Moderate impact ▪ Partially elevated profile with at-grade portion (between Fairfax Road (spur) and Edison Road, and between Malaga Road and Tower Line Road) is aligned as close as possible to parallel Edison Highway. Parcels with direct access to Edison Highway in this segment would lose this access. In many cases, Edison Highway serves as the primary point of access. ▪ Requires realignment of Edison Highway through the town of Edison to accommodate the HST viaduct. This would potentially affect trucking access to several industrial parcels in this area.
Local traffic effects around stations	**Common to all alternatives** Not applicable. No station location.				
Local traffic effects at grade separations	▪ Moderate impact. ▪ New grade separations are proposed at 5 crossings (Edison Road, Malaga Road, Comanche Drive, Tejon Highway and Tower Line Road).	▪ Low impact. ▪ Change in the Level of Service is not expected to have a large impact on local traffic. No new local road grade separations are anticipated.	▪ Moderate impact. ▪ New grade separations are proposed at 6 crossings (Vineland Road, Edison Road, Malaga Road, Comanche Drive, Tejon Highway and Tower Line Road). ▪ Propose closing through access of East Brundage Lane between Weedpatch Highway and Edison Highway to accommodate at-grade HST alignment.	▪ Low impact. ▪ Change in the Level of Service is not expected to have a large impact on local traffic. No new local road grade separations are anticipated.	▪ Moderate impact. ▪ New grade separations are proposed at 5 crossings (Weedpatch Highway, Vineland Road, Comanche Drive, Tejon Highway and Tower Line Road). ▪ Propose closing East Brundage Lane at Edison Highway to accommodate at-grade HST alignment.

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Environmental Resources					
Waterways/Habitat Areas	Crosses 1 waterway: ▪ Caliente Creek Crosses 1.9 acres of wetland habitat all along the alignment, consisting of: ▪ 0.6 acre of irrigation ponds ▪ 1.3 acres river habitat Impacts 81 acres for 4 threatened and endangered species: ▪ Bakersfield Cactus in the Edison area and around Caliente Creek ▪ San Joaquin woolly-threads and California jewel-flower around Caliente Creek	Crosses 1 waterway: ▪ Caliente Creek Crosses 1.9 acres of wetland habitat all along the alignment, consisting of: ▪ 0.6 acre of irrigation ponds ▪ 1.3 acres river habitat Impacts 81 acres for 4 threatened and endangered species: ▪ Bakersfield Cactus in the Edison area and around Caliente Creek ▪ San Joaquin woolly-threads and California jewel-flower around Caliente Creek	Crosses 1 waterway: ▪ Caliente Creek Crosses 1.9 acres of wetland habitat all along the alignment, consisting of: ▪ 0.6 acre of irrigation ponds ▪ 1.3 acre of river habitat Impacts 80 acres for 4 threatened and endangered species: ▪ Bakersfield Cactus in the Edison area and around Caliente Creek ▪ San Joaquin woolly-threads and California jewel-flower around Caliente Creek	Crosses 1 waterway: ▪ Caliente Creek Crosses 3.5 acres of wetland habitat all along the alignment, consisting of: ▪ 2.2 acres of irrigation ponds ▪ 0.9 acre of river habitat ▪ 0.4 acre of unclassified wetland habitat Impacts 72 acres for 4 threatened and endangered species: ▪ Bakersfield Cactus in the Edison area and around Caliente Creek ▪ San Joaquin woolly-threads and California jewel-flower around Caliente Creek	Crosses 1 waterway: ▪ Caliente Creek Crosses 4.5 acres of wetland habitat all along the alignment, consisting of: ▪ 3.1 acres of irrigation ponds ▪ 0.9 acre of river habitat ▪ 0.5 acre of unclassified wetland habitat Impacts 73 acres for 4 threatened and endangered species: ▪ Bakersfield Cactus in the Edison area and around Caliente Creek ▪ San Joaquin woolly-threads and California jewel-flower around Caliente Creek
Cultural Resources	**Common to all alternatives** Not a differentiator. No impacts to National Register of Historic Places-listed or CHRIS database properties.				
Parklands	**Common to all alternatives** Not a differentiator. No parks within the right-of-way or a quarter-mile of the alignment.				
Agricultural lands	▪ 161 acres important ▪ 122 acres prime			▪ 145 acres important ▪ 131 acres prime	▪ 152 acres important ▪ 138 acres prime
Noise and vibration	1,525 noise receptors (within 700 to 1,300 feet): ▪ 1,522 residential parcels ▪ 2 churches ▪ 1 school Vibration impacts: 98 residential parcels within 275 feet.	1,487 noise receptors (within 700 to 1,300 feet): ▪ 1,484 residential parcels ▪ 2 churches ▪ 1 school Vibration impacts: 100 residential parcels within 275 feet.		1,549 noise receptors (within 700 to 1,300 feet): ▪ 1,546 residential parcels ▪ 2 churches ▪ 1 school Vibration impacts: 134 residential parcels within 275 feet.	1,507 noise receptors (within 700 to 1,300 feet): • 1,504 residential parcels • 2 churches • 1 school Vibration impacts: 136 residential parcels within 275 feet.
Visual/scenic resources	838 residential parcels within a quarter-mile of an elevated HST structure.	760 residential parcels within a quarter-mile of an elevated HST structure.		881 residential parcels within a quarter-mile of an elevated HST structure.	771 residential parcels within a quarter-mile of an elevated HST structure.
Geotechnical constraints	**Common to all alternatives** Not a differentiator. ▪ Crosses 1 unnamed fault. ▪ 0 acres of highly erodible soils (K Factor > 0.4).				
Hazardous materials	5 hazardous materials sites within the alignment corridor.			13 hazardous materials sites within the alignment corridor.	

Measurement Criteria	Prelim AA E2A (Partially At-Grade) Preliminary AA Recommended	Prelim AA E2B (All Elevated) Preliminary AA Recommended	New E2 (At-Grade) Proposed New Alignment Option	Prelim AA E4 (All Elevated) Preliminary AA Recommended	New E4 (At-Grade) Proposed New Alignment Option
Agency and Public Input					
Agency and Public Input	Stakeholder feedback indicates that this is the least desirable alternative because it requires the most extensive reconstruction of SR 58 interchanges and overpasses. At-grade construction could affect water conveyance systems.	Stakeholder feedback supports this alternative because the elevated alignment would intrude into the SR 58 ROW, but not substantially displace SR 58 ramps and overpasses. The elevated alignment may also allow re-establishing farmed areas under the structure after HST construction is completed.	County feedback indicates that overpass and road realignments in the vicinity of Edison would conform to County transportation plans and policies. Stakeholder feedback mentioned the disruption to farmland water conveyance systems and drainage issues resulting from the HST subgrade profile, but believed these issues could be addressed. Because this at-grade alternative produced minimal disruption to agricultural operations and town functions, it was considered viable.	Stakeholders were concerned that the elevated structure through Edison would create an additional safety hazard for trucks serving the agriculture packing and shipping facilities along Edison Highway. In addition, shifting Edison Highway closer to businesses would constrain truck movements at loading docks, and limit access to public facilities along Edison Highway, such as the town post office. Concern was also expressed that elevated structures would intrude into the recreational area of Edison Middle School and be a safety hazard for students. This alternative was thought to be less desirable than the E2 options.	The same concerns as expressed for Prelim AA E4 apply to this option. In addition, the County thought that the new overpass connector ramps, required to maintain north-south access to Sierra Highway where the HST was at grade, would create safety hazards for drivers by requiring new grade crossings of the UPRR.

Table A-2: Tehachapi Subsection – Evaluation Matrix

Note: Key factors that distinguish among the alternatives are highlighted in yellow.

Measurement Criteria	New Alternative T3 2.80% Average Slope, 3.30% Sustained Slope over 8 miles Proposed New Alignment	Preliminary AA Alternative T3-1 2.65% Average Slope, 2.75% Sustained Slope over 12 miles Preliminary AA Recommended	Preliminary AA Alternative T3-2 2.5% Average Slope, 2.5% Sustained Slope over 20 miles Preliminary AA Recommended
Design Objectives			
Journey time (220 mph)	**Common to all alternatives** Not a differentiator. Because of the slope in this subsection, the profile would affect rolling stock performance; a detailed speed model would need to be performed to accurately estimate the journey time. All alignments would generally have a maximum speed of 220 mph in vicinity of Tehachapi and less than 220 mph on incline sections, depending on slopes.		
Route length	Total Length: 39.40 miles	Total Length: 40.35 miles	Total Length: 40.52 miles
Intermodal connections	**Common to all alternatives** Not applicable. No station location.		
Capital costs	▪ Lowest capital costs. New T3 has a significant reduction in viaduct length and height, as compared to Prelim AA T3-1 and Prelim AA T3-2. Includes: ▪ 3.4 miles elevated structure ▪ 10.9 miles of tunnel ▪ 2 UPRR Crossings ▪ 3 roadway grade separations ▪ Requires constructing grade separations at Bealeville Road, SR 58, and Cameron Canyon Road.	▪ Moderate capital costs. ▪ Prelim AA T3-1 offers an overall reduction in length and height of viaducts, as compared to Prelim AA T3-2. Prelim AA T3-1 has the greatest tunnel length. Includes: ▪ 8.0 miles of elevated structure ▪ 12.8 miles of tunnel ▪ 2 UPRR Crossings ▪ 4 roadway grade separations ▪ Requires construction grade separations at Bealeville Road, Cameron Canyon Road, Holt St, and Camelot Boulevard.	▪ Highest capital costs. ▪ Prelim AA T3-2 has the most linear feet of elevated track. The elevated track is considerably taller, and has longer continuous segments as compared to New T3 and Prelim AA T3-1. Prelim AA T3-2 has a greater capital cost than New T3 and Prelim AA T3-1. Includes: ▪ 11.0 miles of elevated structure ▪ 10.3 miles of tunnel ▪ 2 UPRR Crossings ▪ 3 roadway grade separation ▪ Requires construction grade separations at Cameron Canyon Road, Holt Street, and Camelot Boulevard.
Operating costs	**Common to all alternatives** Not a differentiator, operating costs across all alternatives would be very similar.		
Maintenance costs	▪ Lowest Costs. ▪ For the New T3, the length of elevated structure is significantly reduced, as compared to Prelim AA T3-1 and Prelim AA T3-2, thereby reducing the overall maintenance costs.	▪ Moderate Costs. ▪ For Prelim AA T3-1, the length of elevated guideway is slightly reduced over Prelim AA T3-2, lessening long-term maintenance costs. ▪ For Prelim AA T3-1, the length of tunnel is the longest of all alternatives, thereby increasing maintenance costs.	▪ Highest Costs. ▪ For Prelim AA T3-2, the longer span and taller structures would result in the highest maintenance costs of all the alternatives.
Land Use			
Potential for Transit-Oriented Development	**Common to all alternatives** Not applicable. No station location.		

Measurement Criteria	New Alternative T3 2.80% Average Slope, 3.30% Sustained Slope over 8 miles Proposed New Alignment	Preliminary AA Alternative T3-1 2.65% Average Slope, 2.75% Sustained Slope over 12 miles Preliminary AA Recommended	Preliminary AA Alternative T3-2 2.5% Average Slope, 2.5% Sustained Slope over 20 miles Preliminary AA Recommended
Consistency with other planning efforts	**Common to all alternatives** Not a differentiator.		
Constructability			
Constructability	▪ Easiest to construct. ▪ This alignment would have shorter structures (length and height). ▪ All alignments have 2 crossings of the UPRR. Near Tehachapi, the crossing at Tehachapi Boulevard is skewed and may require columns on the UPRR right-of-way, and also may require straddle-bent construction to carry the elevated guideway over the UPRR tracks. ▪ This alignment crosses SR 58 east of Tehachapi at a high skew (almost parallel). The profile of the HST at this crossing is at-grade, thereby requiring reconstruction of SR 58 to be grade-separated over or under the HST. Due to the high skew, the length of SR 58 realignment would be greater than for typcial crossings. Early coordination with Caltrans during preliminary design would be needed for this crossing. This alignment avoids construction in the potentially sensitive Proctor Lake. ▪ For construction access, this is within the general proximity of SR 58 for most of the segment length. Existing local roads provide access for most of the construction, where other locations for tunnel/viaduct construction would require creating temporary access. Temporary construction access may become permanent access to tunnel/viaduct locations for maintenance and emergency purposes upon completion of the rail alignment. South of the Garlock fault, this alignment is further away from SR 14 and SR 58, but is close to other local roads.	▪ Moderately difficult to construct. ▪ All alignments have 2 crossings of the UPRR. Near Tehachapi, the crossing at Tehachapi Boulevard is skewed, and may require columns on the UPRR right-of-way, and possibly a straddle-bent construction to carry the elevated guideway over the UPRR tracks. ▪ Alignments cross SR 58 east of Tehachapi. This crossing may require column locations for the overcrossing structure on Caltrans right-of-way to avoid a costly clear span for this crossing. Early coordination with Caltrans during preliminary design would be needed for this crossing. ▪ For access for construction, this is within the general proximity of SR 58 for most of the segment length. Existing local roads provide access for most of the construction, where other locations for tunnel/viaduct construction would require creating temporary access. Temporary construction access may become permanent access to tunnel/viaduct locations for maintenance and emergency purposes upon completion of the rail alignment.	
Disruption to existing railroads	**Common to all alternatives** Not a differentiator. ▪ Low impact. ▪ 2 UPRR crossings would require coordination during design development and during construction to ensure existing freight operations are not affected.		
Disruption to and relocation of utilities	Crossings: ▪ 2 natural gas lines ▪ 7 electric transmission lines	Crossings: ▪ 3 natural gas lines ▪ 7 electric transmission lines	

Measurement Criteria	New Alternative T3 2.80% Average Slope, 3.30% Sustained Slope over 8 miles Proposed New Alignment	Preliminary AA Alternative T3-1 2.65% Average Slope, 2.75% Sustained Slope over 12 miles Preliminary AA Recommended	Preliminary AA Alternative T3-2 2.5% Average Slope, 2.5% Sustained Slope over 20 miles Preliminary AA Recommended
Disruption to Communities			
ROW Acquisition/ Displacement Parcels crossed (Acres affected)	▪ 31 agricultural parcels (687 acres) ▪ 2 residential parcels (23 acres) ▪ 0 commercial parcels (0 acres) ▪ 9 industrial parcels (249 acres)	▪ 29 agricultural parcels (666 acres) ▪ 5 residential parcels (26 acres) ▪ 2 commercial parcels (5 acres) ▪ 13 industrial parcels (181 acres)	▪ 30 agricultural parcels (842 acres) ▪ 5 residential parcels (26 acres) ▪ 2 commercial parcels (5 acres) ▪ 13 industrial parcels (197 acres)
Properties with access affected	**Common to all alternatives** Not a differentiator. ▪ Low impact. ▪ Major property access (i.e., via local roads) would not be affected. Minor access roads and driveways may be affected where the alignment is at-grade. Much of this subsection is rural in nature where parcels are very large in size and existing access is very limited. These properties are mainly rural, and mitigation strategies could provide alternate access points or provide grade-separated access, as required.		
Local traffic effects around stations	**Common to all alternatives** Not applicable. No station location.		
Local traffic effects at grade separations	▪ Low to moderate impact. ▪ The at-grade guideway for New T3 would affect 2 minor roadways and one major roadway (SR 58). "Minor roadways affected" refers to at-grade roadways impacted by the HST where a decision is necessary to determine whether the road is closed or grade separated. Given that the affected local roads serve as primary access to much of the surrounding rural communities, access is critical and would need to be maintained. Grade separations would need to be made at Bealeville Road, SR 58, and Cameron Canyon Road.	▪ Low impact. ▪ The at-grade guideway for Prelim AA T3-1 would affect 3 minor roadways. "Minor roadways affected" refers to at-grade roadways impacted by the HST where a decision is necessary to determine whether the road is closed or grade separated. Given that the affected local roads serve as primary access to much of the surrounding rural communities, access is critical and would need to be maintained. Grade separations would need to be made at Cameron Canyon Road, Holt Street, and Camelot Boulevard.	▪ Low impact. ▪ Similar effect as Prelim AA T3-1, at the at-grade guideway would affect 3 minor roadways. Grade separations would need to be made at Cameron Canyon Road, Holt Street, and Camelot Boulevard.

Measurement Criteria	New Alternative T3 2.80% Average Slope, 3.30% Sustained Slope over 8 miles Proposed New Alignment	Preliminary AA Alternative T3-1 2.65% Average Slope, 2.75% Sustained Slope over 12 miles Preliminary AA Recommended	Preliminary AA Alternative T3-2 2.5% Average Slope, 2.5% Sustained Slope over 20 miles Preliminary AA Recommended
Environmental Resources			
Waterways/Habitat Areas	Crosses 39 waterway: ▪ Clear Creek ▪ Tehachapi Creek ▪ Tweedy Creek ▪ Unnamed waterways Crosses 5 acres of wetland habitat all along the alignment, consisting of: ▪ 0.4 acre of riverine ▪ 4.5 acres other ▪ 0.1 acre of freshwater forested/shrub wetland Impacts 48 acres for 4 threatened and endangered species: ▪ Blunt-nosed leopard lizard ▪ California jewel-flower ▪ San Joaquin woolly-thread Tehachapi slender salamander	Crosses 37 waterways: ▪ Clear Creek ▪ Tehachapi Creek ▪ Tweedy Creek ▪ Unnamed waterways Crosses 10 acres of wetland habitat along the alignment, consisting of: ▪ 4.9 acres of freshwater emergent wetland ▪ 0.4 acre of riverine ▪ 4.6 acres other ▪ 0.1 acre of freshwater forested/shrub wetland No crossing of designated critical habitat. Impacts 45 acres for 3 threatened or endangered species: ▪ Blunt-nosed leopard lizard ▪ California jewel-flower ▪ San Joaquin woolly-thread	Crosses 39 waterways: ▪ Clear Creek ▪ Tehachapi Creek ▪ Tweedy Creek ▪ Unnamed waterways Crosses 10 acres of wetland habitat, including: ▪ 4.9 acres of freshwater emergent wetland ▪ 0.4 acre of riverine ▪ 4.6 acres other ▪ 0.1 acre of freshwater forested/shrub wetland No crossing of designated critical habitat. Impacts 1 acre for 1 threatened or endangered species: ▪ Tehachapi slender salamander
Cultural Resources	No impact on National Register of Historic Places listed structures. Crosses 4 sites listed in the CHRIS database.	No impact on National Register of Historic Places listed structures. Crosses 3 sites listed in the CHRIS database.	No impact on National Register of Historic Places–listed structures. Crosses 1 site listed in the CHRIS database.
Parklands	**Common to all alternatives** Not a differentiator. No parks are within the right-of-way or a quarter-mile of the alignment.		
Agricultural lands	**Common to all alternatives** Not a differentiator. Does not traverse any important agricultural lands.		
Noise and vibration	68 noise receptors (within 700 to 1,300 feet): ▪ 66 residential parcels ▪ 1 hospital ▪ 1 school ▪ Vibration impacts: 6 residential parcels within 275 feet.	116 sensitive noise receptors (within 700 to 1,300 feet): ▪ 114 residential parcels ▪ 1 hospital ▪ 1 school ▪ Vibration impacts 10 residential parcels within 275 feet.	74 sensitive noise receptors (within 700 to 1,300 feet): ▪ 72 residential parcels ▪ 1 hospital ▪ 1 school ▪ Vibration impacts 8 residential parcels within 275 feet.
Visual/scenic resources	8 residential parcels within quarter-mile of elevated structure.	7 residential parcels within quarter-mile of elevated structure.	10 residential parcels within quarter-mile of elevated structure.

Measurement Criteria	New Alternative T3 2.80% Average Slope, 3.30% Sustained Slope over 8 miles Proposed New Alignment	Preliminary AA Alternative T3-1 2.65% Average Slope, 2.75% Sustained Slope over 12 miles Preliminary AA Recommended	Preliminary AA Alternative T3-2 2.5% Average Slope, 2.5% Sustained Slope over 20 miles Preliminary AA Recommended
Geotechnical constraints	**Common to all alternatives** Not a differentiator. Crosses 8 faults: ▪ Garlock Fault, south branch ▪ White Wolf Fault ▪ Unnamed Fault 0 acres of highly erodible soils (K Factor > 0.4).		
Hazardous materials	**Common to all alternatives** Not a differentiator. No hazardous materials sites.		
Agency and Public Input			
Agency and Public Input	This new alternative has been viewed favorably by Kern County Planning and Mojave Airport because it avoids the area designated around the airport in the County Airport Land Use Plan, and may affect fewer alternative energy project facilities and high-voltage transmission corridors. The alternative is also viewed favorably by the City of Tehachapi, because it remains subgrade through the planned development area north of SR 58.	Stakeholders from the County and Mojave Airport expressed concern that the alignment would pass on elevated structure through the airport's restricted building zones, require raising the LADWP transmission lines in this area, and trigger FAA approval. The alignment would displace multiple wind and solar project facilities that are producing power for developers who have contractual obligations with major utilities. The alternative is also viewed favorably by the City of Tehachapi, because it remains subgrade through the planned development area north of SR 58. Loop Ranch expressed concern that the alignment would travel through existing cattle feedlot and corral areas and disrupt the ranch's internal road network. Tejon Ranch considered the profile of the alignment favorably, because the primarily tunnel and viaduct alignment would not impede wildlife circulation.	Stakeholders expressed the same concerns and benefits for this alternative as for Prelim AA T3-1.

Table A-2A: Tehachapi-Antelope Valley Tie-in – Evaluation Matrix

Note: Key factors that distinguish among the alternatives are highlighted in yellow.

Measurement Criteria	New Alternative T3 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)	Prelim AA T3-1/Prelim AA T3-2 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)
Design Objectives		
Journey time (220 mph)	4 minutes – 45 seconds	5 minutes – 20 seconds
Route length	Total Length: 17.42 miles	Total Length: 19.55 miles
Intermodal connections	**Common to all alternatives** Not applicable. No station location.	
Capital costs	▪ Lowest capital costs. ▪ New T3 has a significant reduction in track length, and has the least amount of viaduct and tunnel. Includes: ▪ 0.54 mile of elevated structure ▪ 3.28 miles of tunnel ▪ 1 spur track crossing ▪ 5 roadway grade separations ▪ Requires constructing grade separations at Cameron Canyon Road, Oak Creek Road, Mojave-Tropico Road, Backus Road and Dawn Road.	▪ Highest capital costs. ▪ Prelim AA T3-1 and Prelim AA T3-2 are over 2 miles longer then New T3, which also contains the longest tunnel, and roughly a quarter-mile more viaduct. Includes: ▪ 0.76 mile of elevated structure ▪ 3.60 miles of tunnel ▪ 1 spur track crossing ▪ 5 roadway grade separations ▪ Requires construction grade separations at Cameron Canyon Road, Silver Queen Road, Backus Road, Dawn Road, and SR 14.
Operating costs	▪ Lowest Costs. ▪ Operating cost for New T3 would be the lowest due to the shortest length.	▪ Highest Costs. ▪ Operating cost for Prelim AA T3-1 and Prelim AA T3-2 would be the highest due to the longest length.
Maintenance costs	▪ Lowest Costs. ▪ For New T3, the length of the elevated structure and tunnel is shorter than that of Prelim AA T3-1 and Prelim AA T3-2, thereby reducing the overall maintenance costs.	▪ Highest Costs. ▪ For Prelim AA T3-1 and Prelim AA T3-2, the additional length of elevated structures and tunnel are the reason for the increase in the long-term maintenance costs.
Land Use		
Potential for Transit-Oriented Development	**Common to all alternatives** Not applicable. No station location.	

Measurement Criteria	New Alternative T3 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)	Prelim AA T3-1/Prelim AA T3-2 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)
Consistency with other planning efforts	**Common to all alternatives** Not a differentiator.	
Constructability		
Constructability	▪ Easiest to construct. ▪ New T3 has shorter structures and a shorter tunnel. ▪ New T3 has one crossing over spur tracks west of Mojave. The crossing is a perpendicular crossing, thus reducing the complexity of construction when compared to a skewed crossing. ▪ Existing local roads provide access for most of the construction. Tunnel/viaduct construction would require creating temporary access. Temporary construction access may become permanent access to tunnel/viaduct locations for maintenance and emergency purposes upon completion of the rail alignment.	▪ Moderately difficult to construct. ▪ Prelim AA T3-1 and Prelim AA T3-2 have one crossing over spur tracks west of Mojave. The crossing is skewed and may require columns within the rail right-of-way. Straddle-bent construction may be required. ▪ Existing local roads provide access for most of the construction. Tunnel/viaduct construction would require creating temporary access. Temporary construction access may become permanent access to tunnel/viaduct locations for maintenance and emergency purposes upon completion of the rail alignment.
Disruption to existing railroads	▪ Low impact. ▪ 1 spur track crossing would require coordination during design development and during construction to ensure existing freight operations are not affected.	▪ Low impact. ▪ 1 spur track crossing would require coordination during design development, and during construction, to ensure existing freight operations are not affected.
Disruption to and relocation of utilities	**Common to all alternatives** Not a differentiator. Crossings: ▪ 3 natural gas lines ▪ 4 electric transmission lines	
Disruption to Communities		
ROW Acquisition/ Displacement Parcels crossed (Acres affected)	▪ 0 agricultural parcels (0 acres) ▪ 6 residential parcels (1 acre) ▪ 0 commercial parcels (0 acres) ▪ 1 industrial parcel (64 acres)	▪ 0 agricultural parcels (0 acres) ▪ 16 residential parcels (15 acres) ▪ 2 commercial parcels (5 acres) ▪ 6 industrial parcels (30 acres)
Properties with access affected	**Common to all alternatives** Not a differentiator. ▪ Low impact. ▪ Major property access (i.e. via local roads) would not be affected. Minor access roads and driveways may be affected where the alignment is at-grade. Much of this subsection is rural in nature where parcels are very large in size and existing access is very limited. These properties are mainly rural and mitigation strategies could provide alternate access points or provide grade separated access as required.	
Local traffic effects around stations	**Common to all alternatives** Not applicable. No station location.	

Measurement Criteria	New Alternative T3 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)	Prelim AA T3-1/Prelim AA T3-2 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)
Local traffic effects at grade separations	▪ Low impact. ▪ The at-grade guideway for New T3 would affect 5 minor roadways. Grade separations would need to be made at Cameron Canyon Road, Oak Creek Road, Mojave-Tropico Road, Backus Road, and Dawn Road. ▪ All affected roadways that require a grade separation are low-volume, two-lane rural roads.	▪ High impact. ▪ The at-grade guideway for Prelim AA T3-1 and Prelim AA T3-2 would affect 4 minor roadways and one major roadway (SR 14). Grade separations would need to be made at Cameron Canyon Road, Silver Queen Road, Backus Road, Dawn Road, and SR 14. ▪ The SR 14 interchanges at Silver Queen Road, Backus Road and Dawn Road would be impacted and may require reconfiguration, due to the close proximity of the at-grade guideway for Prelim AA T3-1 and Prelim AA T3-2.
Environmental Resources		
Waterways/Habitat Areas	Crosses 7 waterway: ▪ Unnamed waterways Crosses 0.3 acre of wetland habitat. No crossing of designated critical habitat. No impacts to threatened and endangered species.	Crosses 10 waterways: ▪ Unnamed waterways Crosses 1.1 acres of wetland habitat. No crossing of designated critical habitat. No impacts to threatened or endangered species.
Cultural Resources	**Common to all alternatives** Not a differentiator. ▪ No impacts to National Register of Historic Places-listed or CHRIS database properties. ▪ Crosses 2 sites listed in the CHRIS database.	
Parklands	**Common to all alternatives** Not a differentiator. No parks within the right-of-way or a quarter-mile of the alignment.	
Agricultural lands	**Common to all alternatives** Not a differentiator. Does not traverse any important agricultural lands.	
Noise and vibration	40 noise receptors (within 700 to 1,300 feet): 40 residential parcels Vibration impacts: 2 residential parcels within 275 feet.	126 sensitive noise receptors (within 700 to 1,300 feet): 126 residential parcels Vibration impacts: 2 residential parcels within 275 feet.
Visual/scenic resources	**Common to all alternatives** Not a differentiator. 2 residential parcels within a quarter-mile of an elevated HST structure.	
Geotechnical constraints	**Common to all alternatives** Not a differentiator. Crosses 1 fault: Garlock Fault, south branch. 0 acres of highly erodible soils (K Factor > 0.4).	
Hazardous materials	**Common to all alternatives** Not a differentiator. No hazardous materials sites.	

Measurement Criteria	New Alternative T3 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)	Prelim AA T3-1/Prelim AA T3-2 + AV Tie-in (Cameron Canyon Rd – Felsite Avenue)
Agency and Public Input		
Agency and Public Input	This new alternative has been viewed favorably by Kern County Planning and Mojave Airport because it avoids the area designated around the airport in the County Airport Land Use Plan, and may affect fewer alternative energy project facilities and high-voltage transmission corridors.	Stakeholders from the County and Mojave Airport expressed concern that the alignment would pass on elevated structure through the airport's restricted building zones; require raising the LADWP transmission lines in this area; and trigger the need for FAA approval. The alignment would displace multiple wind and solar project facilities that are producing power for developers who have contractual obligations with major utilities.

Table A-3: Antelope Valley Subsection – Evaluation Matrix

Note: Key factors that distinguish among the alternatives are highlighted in yellow.

Measurement Criteria	Preliminary AA AV3B (Partially Elevated) Preliminary AA Recommended	New AV3B (Primarily At-Grade) Proposed New Alignment Option	Preliminary AA AV4 Option (Primarily Elevated) Preliminary AA Recommended	New AV4 Option (Primarily At-Grade) Proposed New Alignment Option
Design Objectives				
Journey time (220 mph)	6 minutes - 59 seconds	6 minutes - 38 seconds	6 minutes - 57 seconds	
Route length	Total Length: 25.6 miles	Total Length: 24.3 miles	Total Length: 25.5 miles	
Intermodal connections	**Common to all alternatives** Not applicable. No station location.			
Capital costs	▪ Moderate costs, primarily due to length of elevated structure. Includes: ▪ 7.0 miles of elevated structure ▪ 0 UPRR Crossings ▪ 11 grade separations ▪ Less than one-third of the alignment is on elevated structure. ▪ Requires approximately 11.0 miles of Sierra Highway realignment (approx. 45 to 85 feet to the west).	▪ Lowest costs, primarily due to the shortest alignment length and minimal elevated structure. However, cost savings would be reduced by the need to construct multiple grade separations. Includes: ▪ 0.5 mile of elevated structure ▪ 0 UPRR Crossings ▪ 16 grade separations Approximately two-tenths of the alignment is on elevated structure. ▪ Requires approximately 10.8 miles of Sierra Highway realignment (approx. 45 feet to the west).	▪ Highest costs, primarily due to most having the most extensive length of elevated structure. Includes: ▪ 7.7 miles of elevated structure ▪ 0 UPRR Crossings ▪ 10 grade separations Approximately one-third of the alignment is on elevated structure.	▪ Low costs, primarily due to not having any elevated structure. However, cost savings would be reduced by the need to construct multiple grade separations. Includes: ▪ 0.0 miles of elevated structure ▪ 0 UPRR crossings ▪ 17 grade separations
Operating costs	▪ Low costs. ▪ Operating cost for Prelim AA AV3B would marginally increase due to a slightly longer length of elevated structures.	▪ Low costs. ▪ Operating cost for the New AV3B would be lowest due to having the shortest length and height of elevated structures.	▪ Highest costs. ▪ Operating costs for Prelim AA AV4 Option would be greater than both AV3Bs due to length and height of structures. The alignment would have higher undulations and would increase energy costs.	▪ Lowest costs. ▪ Operating costs for the New AV4 Option would be slightly lower than the New AV3B, due to not having elevated structures.
Maintenance costs	▪ Moderate costs. ▪ Accessibility to the elevated structures would increase maintenance costs at Rosamond and Lancaster. ▪ Costs would be slightly higher than the New AV3B due to the longer length of the elevated structures.	▪ Low costs. ▪ Fewer elevated structures means easier access, and therefore lower maintenance costs.	▪ Highest costs. ▪ Longest and highest elevated structures are the primary reasons for highest costs of the alternatives.	▪ Lowest costs. ▪ No elevated structures means having the easiest access, and therefore lowest maintenance costs.
Land Use				
Potential for Transit-Oriented Development	**Common to all alternatives** Not applicable. No station location.			

Measurement Criteria	Preliminary AA AV3B (Partially Elevated) Preliminary AA Recommended	New AV3B (Primarily At-Grade) Proposed New Alignment Option	Preliminary AA AV4 Option (Primarily Elevated) Preliminary AA Recommended	New AV4 Option (Primarily At-Grade) Proposed New Alignment Option
Consistency with other planning efforts	**Common to all alternatives** Not a differentiator. All alternatives would traverse multiple planned and approved projects, including the Lancaster Water Reclamation Plant and the Avenue K Transmission Line. However, they would avoid the Sierra Sun Tower Generating Station and Hasa Bleach Manufacturing Plant.			
Constructability				
Constructability	▪ Moderately difficult to construct. ▪ Prelim AA AV3B is predominately between the UPRR right-of-way and Sierra Highway from Rosamond to Palmdale. This would encroach on portions of UPRR property and require some redesign of Sierra Highway. ▪ Construction access is easily achievable because alternatives are within urban limits, or in very close proximity of transportation arterials. ▪ Access to UPRR property for column installations would require UPRR coordination/ permission. ▪ More elevated structure. ▪ Lower impacts to local roads.	▪ Moderately difficult to construct. ▪ New AV3B is predominately between UPRR right-of-way and Sierra Highway from Rosamond to Palmdale. This would encroach on portions of UPRR property and require more realignment of Sierra Highway. ▪ Construction access is easily achievable because alternatives are within urban limits, or in very close proximity of transportation arterials. ▪ Access to State property for column installations would require Caltrans coordination/ permission. ▪ Minimal elevated structure. ▪ New AV3B would cause higher impacts to local roads; therefore, greater construction coordination would be required with the local transportation agency and businesses to construct interchanges.	▪ Moderately difficult to construct. ▪ The Prelim AA AV4 Option entirely avoids UPRR right-of-way, and avoids Sierra Highway by crisscrossing it near Avenue H and Avenue J. ▪ Construction access would be provided via the existing Sierra Highway and local roads. ▪ More elevated structure. Lower impacts to local roads.	▪ Moderately difficult to construct ▪ New AV4 Option entirely avoids UPRR right-of-way, and avoids Sierra Highway by crisscrossing it near Avenue H and Avenue J. ▪ Construction access would be provided via existing Sierra Highway and local roads. ▪ Once right-of-way is acquired, construction can occur with fewer disruptions to Sierra Highway. ▪ No elevated structures. ▪ Higher impacts to local roads and private properties, therefore greater construction coordination would be required to construct interchanges. This would require the most construction easements.
Disruption to existing railroads	▪ Moderate impact. ▪ Prelim AA AV3B does involve disruption to existing railroad operations. ▪ The alignment would require encroachment into the UPRR and Metrolink rights-of-way. Metrolink facilities at Lancaster Station would be impacted.	▪ Moderate impact. ▪ If Sierra Highway is realigned to the west, New AV3B would minimize disruption to existing railroad operations in Lancaster. However, ideally, the alignment should be placed in the UPRR ROW and the freight and Metrolink tracks relocated to the eastern side of the right-of-way. ▪ The at-grade alignment would require greater width to construct than an elevated HST structure. Like AV3B, this option would displace Metrolink facilities at Lancaster Station and encroach into the UPRR right-of-way north of Lancaster Boulevard.	▪ No impact. ▪ Both AV4 Options do not involve disruptions to existing railroad operations. ▪ Existing railroad operations would be disrupted during construction of the grade separations.	▪ No impact. ▪ Both AV4 Options do not involve disruptions to existing railroad operations. ▪ Existing railroad operations would be disrupted during construction of the grade separations.

Measurement Criteria	Preliminary AA AV3B (Partially Elevated) Preliminary AA Recommended	New AV3B (Primarily At-Grade) Proposed New Alignment Option	Preliminary AA AV4 Option (Primarily Elevated) Preliminary AA Recommended	New AV4 Option (Primarily At-Grade) Proposed New Alignment Option
Disruption to and relocation of utilities	**Common to all alternatives** Not a differentiator. Crossings: ▪ 3 natural gas lines ▪ 10 electric transmission lines			
Disruption to Communities				
ROW Acquisition/ Displacement Parcels crossed (Acres affected)	▪ 0 agricultural parcels (0 acres) ▪ 22 residential parcels (13 acres) ▪ 114 commercial parcels (21 acres) ▪ 32 industrial parcels (11 acres)	▪ 0 agricultural parcels (0 acres) ▪ 22 residential parcels (13 acres) ▪ 78 commercial parcels (14 acres) ▪ 30 industrial parcels (11 acres)	▪ 0 agricultural parcels (0 acres) ▪ 24 residential parcels (20 acres) ▪ 148 commercial parcels (55 acres) ▪ 37 industrial parcels (38 acres)	▪ 0 agricultural parcels (0 acres) ▪ 24 residential parcels (21 acres) ▪ 147 commercial parcels (62 acres) ▪ 37 industrial parcels (39 acres)
Properties with access affected	▪ Low impact. ▪ Numerous private parcels and Caltrans SR 14 right-of-way would be affected from Mojave to Rosamond. Approximately 109 parcels would be impacted from Rosamond to Palmdale. The type of parcels include: commercial, industrial, public road, and the UPRR and Metrolink rights-of-way. ▪ Given the partially elevated profile of this option, column placement considerations would take into account minimizing impacts to property access and land uses.	▪ Moderate impact. Because most of the profile is lowered to grade, more properties would have access affected by realigning Sierra Highway to the west, and grade-separating east-west arterials over/under the HST and the UPRR.	▪ Moderate impact. ▪ Approximately 240 parcels would be affected from Rosamond to Palmdale. The type of parcels include mostly commercial and industrial. ▪ Given the primarily elevated profile, column placement considerations would take into account minimizing impacts to property access and land uses (including column placement on the western side of Sierra Highway).	▪ Highest impact. ▪ Because the entire profile is lowered to grade along Sierra Highway, more properties fronting Sierra Highway in Rosamond and Lancaster would have access blocked by the New AV4 Option than by the Preliminary AA AV4 Option. Grade-separating east-west arterials over/under HST and the UPRR arterials could also block access to neighboring land uses.
Local traffic effects around stations	**Common to all alternatives** Not applicable. No station location.			
Local traffic effects at grade separations	▪ Lowest impact. ▪ 11 existing grade separations would need to be adjusted. Existing overcrossings at Avenue H and Avenue L may require modifications. ▪ Change in the Level of Service is not expected to have a large impact on local traffic once the project is completed. ▪ An elevated alignment would provide most grade separations of the UPRR and east-west arterials, and is therefore a safety improvement without requiring new overpasses to be constructed.	▪ Moderate impact. ▪ 16 existing grade separations would need to be adjusted. Existing overcrossings at Avenue H and Avenue L would be impacted and may require modifications. ▪ Additional crossings at Avenue K and M would significantly affect existing commercial/industrial tenants adjacent to the improvements. ▪ Change in the Level of Service is expected to have an impact on local traffic once the project is completed. ▪ Grade separations would be required for the UPRR and the HST; therefore this is a safety improvement.	▪ Low impact. ▪ 16 existing grade separations to be adjusted. ▪ Change in the Level of Service is not expected to have a large impact on local traffic, once the project is completed. ▪ An elevated alignment would provide the most grade separations of the UPRR and east-west arterials, and is therefore a safety improvement without requiring new overpasses to be constructed.	▪ Most impact. ▪ 18 existing grade separations to be adjusted. ▪ Additional crossings at Avenue K and M would significantly affect existing commercial/industrial tenants adjacent to the improvements. ▪ Change in the Level of Service is expected to have an impact on local traffic, once completed. ▪ Grade separations would be required for the UPRR and HST; therefore, this is a safety improvement. ▪ When lowered to grade south of Avenue J, this alternative separates Sierra Highway from numerous properties to the west, which may require new access provision.

Measurement Criteria	Preliminary AA AV3B (Partially Elevated) Preliminary AA Recommended	New AV3B (Primarily At-Grade) Proposed New Alignment Option	Preliminary AA AV4 Option (Primarily Elevated) Preliminary AA Recommended	New AV4 Option (Primarily At-Grade) Proposed New Alignment Option
Environmental Resources				
Waterways/Habitat Areas	Crosses 10 waterways: ▪ Unnamed intermittent waterways Crosses 61 acres of wetland habitat. No crossing of designated critical habitat Impacts 46 acres of habitat for 1 threatened or endangered species: ▪ Mojave ground squirrel	Crosses 6 waterways: ▪ Unnamed intermittent waterways Crosses 62 acres of wetland habitat. No crossing of designated critical habitat Impacts 46 acres of habitat for 1 threatened or endangered species: ▪ Mojave ground squirrel	Crosses 11 waterways: ▪ Unnamed intermittent waterways Crosses 85 acres of wetland habitat. No crossing of designated critical habitat Impacts 44 acres of habitat for 1 threatened or endangered species: ▪ Mojave ground squirrel	Crosses 12 waterways: ▪ Unnamed intermittent waterways Crosses 85 acres of wetland habitat. No crossing of designated critical habitat Impacts 44 acres of habitat for 1 threatened or endangered species: ▪ Mojave ground squirrel
Cultural Resources	▪ No impacts to National Register of Historic Places-listed properties. ▪ Crosses 12 sites listed in the CHRIS database.	▪ No impacts to National Register of Historic Places-listed properties. ▪ Crosses 13 sites listed in the CHRIS database.	▪ No impact on National Register of Historic Places listed properties. ▪ Crosses 18 sites listed in the CHRIS database.	▪ No impact on National Register of Historic Places listed properties. ▪ Crosses 20 sites listed in the CHRIS database.
Parklands	▪ 0 parks within the right-of-way. ▪ 2 parks within a quarter-mile of the alignment.		▪ 1 park within the right-of-way. 2 parks within a quarter-mile of the alignment.	
Agricultural lands	**Common to all alternatives** Not a differentiator. ▪ 0 acres important ▪ 0 acres prime			
Noise and vibration	927 noise receptors (within 700 to 1,300 feet): ▪ 925 residential parcels ▪ 1 church ▪ 1 school Vibration impacts: 275 residential parcels within 275 feet.	890 noise receptors (within 700 to 1,300 feet): ▪ 890 residential parcels ▪ 1 church Vibration impacts: 201 residential parcels within 275 feet.	1,112 noise receptors (within 700 to 1,300 feet): ▪ 1,108 residential parcels ▪ 2 churches ▪ 2 school Vibration impacts: 380 residential parcels within 275 feet.	1,124 noise receptors (within 700 to 1,300 feet): ▪ 1,120 residential parcels ▪ 2 churches ▪ 2 school Vibration impacts: 381 residential parcels within 275 feet.
Visual/scenic resources	1,153 residential parcels within a quarter-mile of the elevated structure.	There are no elevated structures; therefore, there are no visual impacts. However, required grade separations could intrude visually on surrounding uses.	1,319 residential parcels within quarter-mile of elevated structure.	There are no elevated structures; therefore, there are no visual impacts. However, required grade separations could intrude visually on surrounding uses.
Geotechnical constraints	**Common to all alternatives** Not a differentiator. ▪ No known seismic faults. ▪ 0 acres of highly erodible soils (K Factor > 0.4).			
Hazardous materials	8 hazardous materials sites within a quarter-mile of the alignment.	5 hazardous materials sites within a quarter-mile of the alignment.	14 hazardous materials sites within a quarter-mile of the alignment.	

Measurement Criteria	Preliminary AA AV3B (Partially Elevated) Preliminary AA Recommended	New AV3B (Primarily At-Grade) Proposed New Alignment Option	Preliminary AA AV4 Option (Primarily Elevated) Preliminary AA Recommended	New AV4 Option (Primarily At-Grade) Proposed New Alignment Option
Agency and Public Input				
Agency and Public Input	Stakeholders expressed concern that the elevated alignment for this alternative would intrude into the Metrolink ROW, require narrowing Sierra Highway, and displace the Metrolink Station. A new overcrossing of Sierra Highway at Avenue M was deemed feasible if traffic circulation and land uses could be accommodated. In addition, the City of Lancaster affirmed that elevated track over Lancaster Boulevard was critical.	Stakeholders in Lancaster and Rosamond suggested that it would be preferable to place this alignment in the UPRR ROW rather than realign Sierra Highway to the west. However, if this were not possible, the stakeholders affirmed that commercial properties on the western side of Sierra Highway could be partially or fully displaced, with the exception of institutions like the University of Antelope Valley. Grade separation of east-west arterials was considered a community benefit as long as access to Sierra Highway was preserved, and adjoining parcels could be kept intact for future development. Underpasses rather than overpasses were preferred, particularly at newly redesigned Lancaster Boulevard, because construction impacts would be confined to a more limited area.	Stakeholders thought this alternative was desirable because it did not affect Metrolink facilities or the adjacent bike path. Stakeholders affirmed that commercial properties on the western side of Sierra Highway could be displaced, but not split, so development potential could be optimized. A new overcrossing of Sierra Highway at Avenue M was deemed feasible if traffic circulation and land uses could be accommodated. This option would retain elevated track over Lancaster Boulevard, which was critical for the City of Lancaster.	Because this at-grade alternative would sever access to land uses on the western side of Sierra Highway, stakeholders in Rosamond and Lancaster believed that the viability of existing uses could not be easily sustained. This concern applied mainly to public and institutional uses, such as the University of Antelope Valley, along Sierra Highway that would disrupt their operation and force them to relocate. In addition, stakeholders expressed concern that the extensive road work required to grade-separate east-west arterials and re-establish their connectivity with Sierra Highway could displace additional uses and bisect parcels ready for development. Because of these concerns, stakeholders suggested this at-grade alternative was undesirable, and should be dropped from further consideration.

Appendix B – Outreach Meetings

Note: The following list captures outreach meetings held from May 26, 2010 (from the last meeting detailed in the September 2010-Preliminary AA Report) to November 2011.

Stakeholder	Date	Meeting Details
Corridor Cities/ Counties		
Kern County Planning and Public Works Staff	3/3/2011	Reviewed B-P Supplemental AA
City of Tehachapi Planning Staff	3/4/2011	Reviewed B-P Supplemental AA
City of Tehachapi Planning Staff	4/13/2011	Reviewed B-P Supplemental AA
Kern County Planning and Public Works Staff	4/14/2011	Reviewed B-P Supplemental AA
City of Lancaster	4/26/2011	Presented B-P AA and noted additional I-5 alignment study
City of Rosamond	4/27/2011	Presented B-P AA and noted additional I-5 alignment study
City of Palmdale (with California Department of Transportation (Caltrans) and Los Angeles County Metropolitan Transportation Authority (LA Metro))	4/28/2011	Presented B-P AA and noted additional I-5 alignment study
City of Palmdale, Lancaster, County of Los Angeles (with LA Metro)	5/3/2011	Discussed impacts of new I-5 alignment study
City of Palmdale	8/10/2011	Update on Bakersfield-Burbank Studies
City of Lancaster	8/11/2011	Update on Bakersfield-Burbank Studies; Reviewed revised plans/profiles
City of Rosamond	8/11/2011	Update on Bakersfield-Burbank Studies; Reviewed revised plans/profiles
Kern County Planning Staff	8/23/2011	Update on Grapevine study and schedule. Discussed energy project and transportation infrastructure issues related to new T3 alignment in the Mojave
City of Tehachapi Planning Staff	8/24/2011	Discussed Grapevine study and profile of all T alternatives relative to the planned development projects north of the City of Tehachapi

Stakeholder	Date	Meeting Details
Local, State, and Federal Agency Briefings		
Association of Rural Town Councils	5/27/2010	Briefed multiple Town Councils on AA
Mojave Air and Spaceport	6/2/2010	Reviewed AA and discussed airport impacts
Palmdale Water District	9/22/2010	Presented AA and discussed route impacts
U.S Environmental Protection Agency, U.S Army Corps of Engineers, U.S Fish and Wildlife Service, California Department of Fish and Game, Regional Water Quality Control Board	10/05/2010	Review of project history, programmatic alternatives and alternatives carried forward in environmental analysis, biological resources potentially present in the project area, discussion of potential impacts and agency concerns
Bureau of Land Management	10/27/2010	Reviewed AA and discussed 'crossing points' and potential permitting requirements
U.S Army Corps of Engineers	04/06/2011	Wetland delineation survey methodology in playa areas
Tehachapi Municipal Advisory Commission	4/13/2011	Reviewed B-P Supplemental AA
Edison School District Superintendent	4/14/2011	Reviewed B-P Supplemental AA
Bureau of Land Management	4/26/2011	Presented AA, noted additional I-5 alignment study, discussed environmental impacts
LA Metro (with Los Angeles County Supervisor Mike Antonovich staff)	4/27/2011	Presented B-P AA and noted additional I-5 alignment study
LA Metro and Caltrans (with the City of Palmdale)	4/28/2011	Presented B-P AA and noted additional I-5 alignment study
Department of Defense - Plant 42 (with Defense contractors)	4/28/2011	Presented B-P AA and noted additional I-5 alignment study
LA Metro (with the City of Palmdale, Lancaster, County of Los Angeles)	5/3/2011	Discussed impacts of new I-5 alignment study
Department of Defense – Plant 42 (with Defense contractors)	10/12/2011	Reviewed B-P Supplemental AA

Stakeholder	Date	Meeting Details
Caltrans District 6	11/30/2011	Discussed the potential HST alignment encroachment on SR 58 and SR 14 interchanges
Elected Officials and Staff		
Mayor Jim Ledford, City of Palmdale	4/26/2011	Noted additional I-5 alignment study
LA County Supervisor Mike Antonovich staff (with LA Metro)	4/27/2011	Presented B-P AA and noted additional I-5 alignment study
Mojave Air & Spaceport	8/9/2011	Update on Bakersfield-Burbank Studies; Reviewed revised plans/profiles
LA County Supervisor Mike Antonovich staff	8/10/2011	Update on Bakersfield-Burbank Studies; Reviewed revised plans/profiles
Environmental Justice		
Mercado Outdoor Market - Bakersfield	12/11/2010	HST information booth at the Mercado Outdoor Market
Activity Centers		
University Antelope Valley	6/1/2010	Reviewed AA with University of Antelope Valley principals
Loop Ranch	3/4/2011	Reviewed B-P Supplemental AA
Tejon Ranch	3/4/2011	Reviewed B-P Supplemental AA
Edison Area Agra-Business Stakeholders	4/13/2011	Reviewed B-P Supplemental AA
Tejon Ranch	8/9/2011	Update on Bakersfield-Burbank Studies
University of Antelope Valley	10/11/2011	Reviewed B-P Supplemental AA
Silver Queen Mine	10/13/2011	Reviewed B-P proposed plans and profiles and B-P Supplemental AA
Loop Ranch	10/13/2011	Reviewed B-P Supplemental AA

Stakeholder	Date	Meeting Details
Community Open Houses		
Antelope Valley Stakeholders Meeting	6/2/2010	Updated key stakeholders on AA
Lancaster Public Information Meeting	6/2/2010	Updated Public on AA
Tehachapi Public Information Meeting	6/10/2010	Updated Public on AA
Businesses/Utilities		
Antelope Valley Hispanic Chamber of Commerce	6/1/2010	Presented slide presentation on HSR system and AA
Sempra Energy (Southern California Gas Co.)	6/2/2010	Reviewed AA and discussed ‘crossing points’
Sempra Energy	9/22/2010	Follow-up on ‘crossing points’ and needs (P-LA team and B-P team)
Los Angeles Department of Water & Power	10/26/2010	Reviewed AA and discussed ‘crossing points’
Los Angeles Department of Water and Power	10/11/2011	Reviewed SAA and discussed ‘crossing points’
Southern California Edison	10/12/2011	Reviewed SAA and discussed ‘crossing points’
Sempra Energy	10/12/2011	Reviewed SAA and discussed ‘crossing points’

Appendix C – Plan and Profile Drawings

Revised drawings have been included in this report for the following alternatives:

- Edison Subsection – New E2 and New E4
- Tehachapi Subsection – Prelim AA T3-1, Prelim AA T3-2, and New T3
- Antelope Valley Subsection – New AV3B and New AV4 Option

For drawings of other alternatives, see Appendix E of the September 2010 Preliminary AA Report. Drawings of the tie-ins to the Palmdale to Los Angeles Section can be found in Table D.

GENERAL SHEETS

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
CB0001	INDEX OF SHEETS	02 OF 51

KEY MAP

DRAWING No.	DRAWING DESCRIPTION	SHEET No.
C1000	KEY MAP	03 OF 51

ALIGNMENT NEW E2

DRAWING No.	DRAWING DESCRIPTION			SHEET No.
C1001	EDISON SUBSECTION	STA. 7300+00 TO 7450+00	PLAN AND PROFILE	04 OF 51
C1003	EDISON SUBSECTION	STA. 7450+00 TO 7600+00	PLAN AND PROFILE	06 OF 51
C1005	EDISON SUBSECTION	STA. 7600+00 TO 7750+00	PLAN AND PROFILE	08 OF 51
C1007	EDISON SUBSECTION	STA. 7750+00 TO 7900+00	PLAN AND PROFILE	10 OF 51
C1009	EDISON SUBSECTION	STA. 7900+00 TO 8050+00	PLAN AND PROFILE	12 OF 51

ALIGNMENT NEW E4

DRAWING No.	DRAWING DESCRIPTION			SHEET No.
C1002	EDISON SUBSECTION	STA. 7300+00 TO 7450+00	PLAN AND PROFILE	05 OF 51
C1004	EDISON SUBSECTION	STA. 7450+00 TO 7600+00	PLAN AND PROFILE	07 OF 51
C1006	EDISON SUBSECTION	STA. 7600+00 TO 7750+00	PLAN AND PROFILE	09 OF 51
C1008	EDISON SUBSECTION	STA. 7750+00 TO 7900+00	PLAN AND PROFILE	11 OF 51
C1010	EDISON SUBSECTION	STA. 7900+00 TO 8050+00	PLAN AND PROFILE	13 OF 51

ALIGNMENT NEW T3, T3-1 & T3-2

DRAWING No.	DRAWING DESCRIPTION			SHEET No.
C1011	TEHACHAPI SUBSECTION	STA. 8000+00 TO 8600+00	PLAN AND PROFILE	14 OF 51
C1012	TEHACHAPI SUBSECTION	STA. 8600+00 TO 9200+00	PLAN AND PROFILE	15 OF 51
C1013	TEHACHAPI SUBSECTION	STA. 9200+00 TO 9800+00	PLAN AND PROFILE	16 OF 51
C1014	TEHACHAPI SUBSECTION	STA. 9800+00 TO 10400+00	PLAN AND PROFILE	17 OF 51
C1015	TEHACHAPI SUBSECTION	STA. 9800+00 TO 10400+00	PLAN AND PROFILE	18 OF 51

ALIGNMENT NEW AV3B & NEW AV4-OPTION

DRAWING No.	DRAWING DESCRIPTION			SHEET No.
C1016	ANTELOPE VALLEY SUBSECTION	STA. 10400+00 TO 10550+00	PLAN AND PROFILE	19 OF 51
C1017	ANTELOPE VALLEY SUBSECTION	STA. 10550+00 TO 10700+00	PLAN AND PROFILE	20 OF 51
C1018	ANTELOPE VALLEY SUBSECTION	STA. 10700+00 TO 10850+00	PLAN AND PROFILE	21 OF 51
C1019	ANTELOPE VALLEY SUBSECTION	STA. 10400+00 TO 10550+00	PLAN AND PROFILE	22 OF 51
C1020	ANTELOPE VALLEY SUBSECTION	STA. 10550+00 TO 10700+00	PLAN AND PROFILE	23 OF 51
C1021	ANTELOPE VALLEY SUBSECTION	STA. 10700+00 TO 10850+00	PLAN AND PROFILE	24 OF 51
C1022	ANTELOPE VALLEY SUBSECTION	STA. 10850+00 TO 11000+00	PLAN AND PROFILE	25 OF 51
C1023	ANTELOPE VALLEY SUBSECTION	STA. 11000+00 TO 11150+00	PLAN AND PROFILE	26 OF 51
C1024	ANTELOPE VALLEY SUBSECTION	STA. 11150+00 TO 11300+00	PLAN AND PROFILE	27 OF 51
C1025	ANTELOPE VALLEY SUBSECTION	STA. 11300+00 TO 11450+00	PLAN AND PROFILE	28 OF 51
C1026	ANTELOPE VALLEY SUBSECTION	STA. 11450+00 TO 11480+00	PLAN AND PROFILE	29 OF 51
C1027	ANTELOPE VALLEY SUBSECTION	STA. 11480+00 TO 11510+00	PLAN AND PROFILE	30 OF 51
C1028	ANTELOPE VALLEY SUBSECTION	STA. 11510+00 TO 11540+00	PLAN AND PROFILE	31 OF 51
C1029	ANTELOPE VALLEY SUBSECTION	STA. 11540+00 TO 11570+00	PLAN AND PROFILE	32 OF 51
C1030	ANTELOPE VALLEY SUBSECTION	STA. 11570+00 TO 11600+00	PLAN AND PROFILE	33 OF 51
C1031	ANTELOPE VALLEY SUBSECTION	STA. 11600+00 TO 11630+00	PLAN AND PROFILE	34 OF 51
C1032	ANTELOPE VALLEY SUBSECTION	STA. 11630+00 TO 11660+00	PLAN AND PROFILE	35 OF 51
C1033	ANTELOPE VALLEY SUBSECTION	STA. 11660+00 TO 11690+00	PLAN AND PROFILE	36 OF 51
C1034	ANTELOPE VALLEY SUBSECTION	STA. 11690+00 TO 11720+00	PLAN AND PROFILE	37 OF 51
C1035	ANTELOPE VALLEY SUBSECTION	STA. 11720+00 TO 11750+00	PLAN AND PROFILE	38 OF 51

CROSS SECTIONS

DRAWING No.	DRAWING DESCRIPTION			SHEET No.
C3000	EDISON SUBSECTION	NEW E2 & NEW E4	CROSS SECTIONS	39 OF 51
C3001	EDISON SUBSECTION	NEW E2 & NEW E4	CROSS SECTIONS	40 OF 51
C3002	EDISON SUBSECTION	NEW E2 & NEW E4	CROSS SECTIONS	41 OF 51
C3003	TEHACHAPI SUBSECTION	NEW T3, T3-1 & T3-2	CROSS SECTIONS	42 OF 51
C3004	TEHACHAPI SUBSECTION	NEW T3, T3-1 & T3-2	CROSS SECTIONS	43 OF 51
C3005	TEHACHAPI SUBSECTION	NEW T3, T3-1 & T3-2	CROSS SECTIONS	44 OF 51
C3006	TEHACHAPI SUBSECTION	NEW T3, T3-1 & T3-2	CROSS SECTIONS	45 OF 51
C3007	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	46 OF 51
C3008	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	47 OF 51
C3009	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	48 OF 51
C3010	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	49 OF 51
C3011	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	50 OF 51
C3012	ANTELOPE VALLEY SUBSECTION	NEW AV3B & NEW AV4-OPTION	CROSS SECTIONS	51 OF 51

12/12/2011 12:18:00 PM $FILEL$

MOR53804

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY D. MORENO
CHECKED BY J. BINNING
IN CHARGE Q. EARLE
DATE 07/26/11

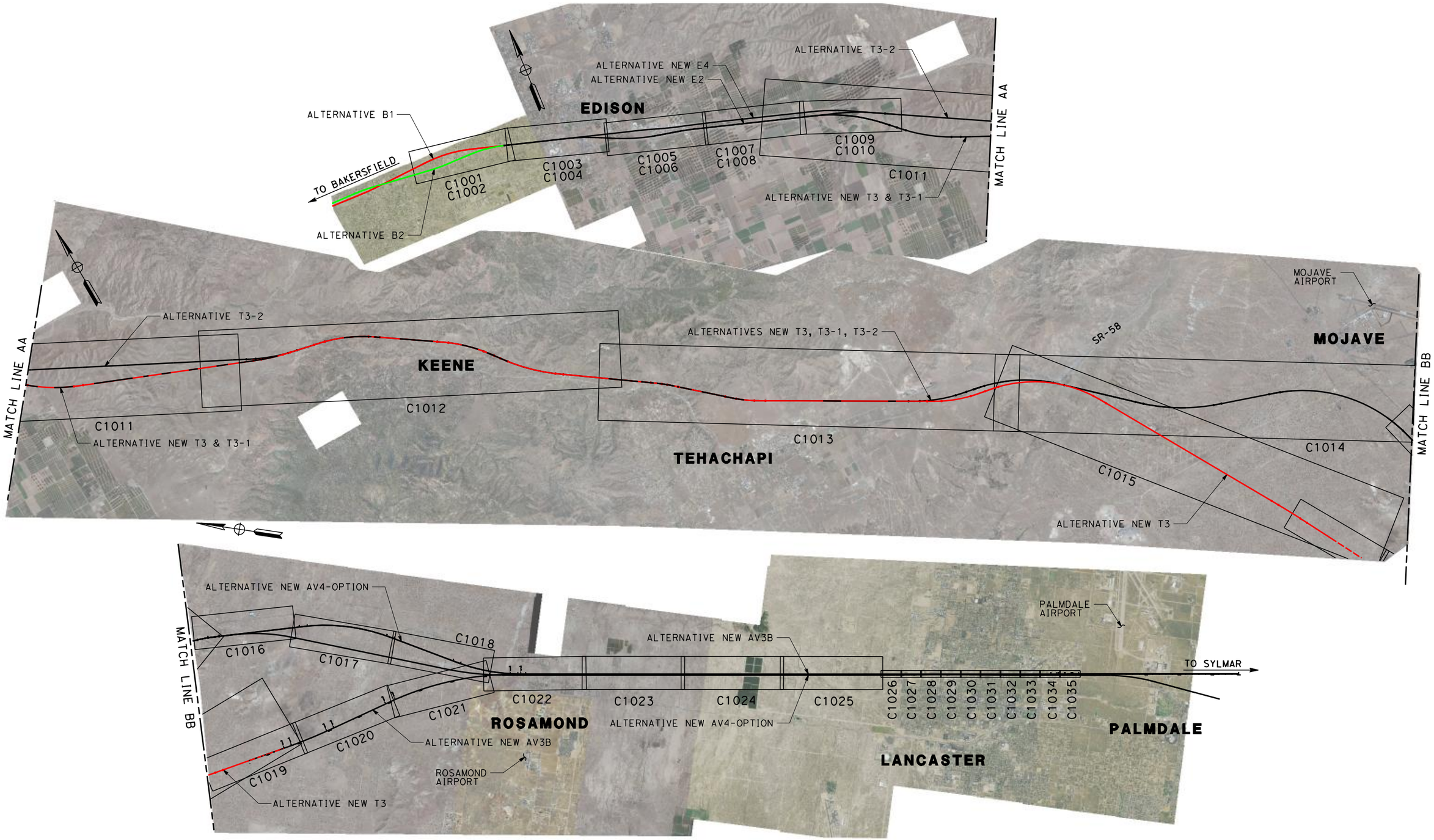
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
INDEX OF SHEETS

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. CB0001
SCALE NOT TO SCALE
SHEET NO. 2 OF 51



REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY C. RAMIREZ
DRAWN BY V. ORTEGA
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

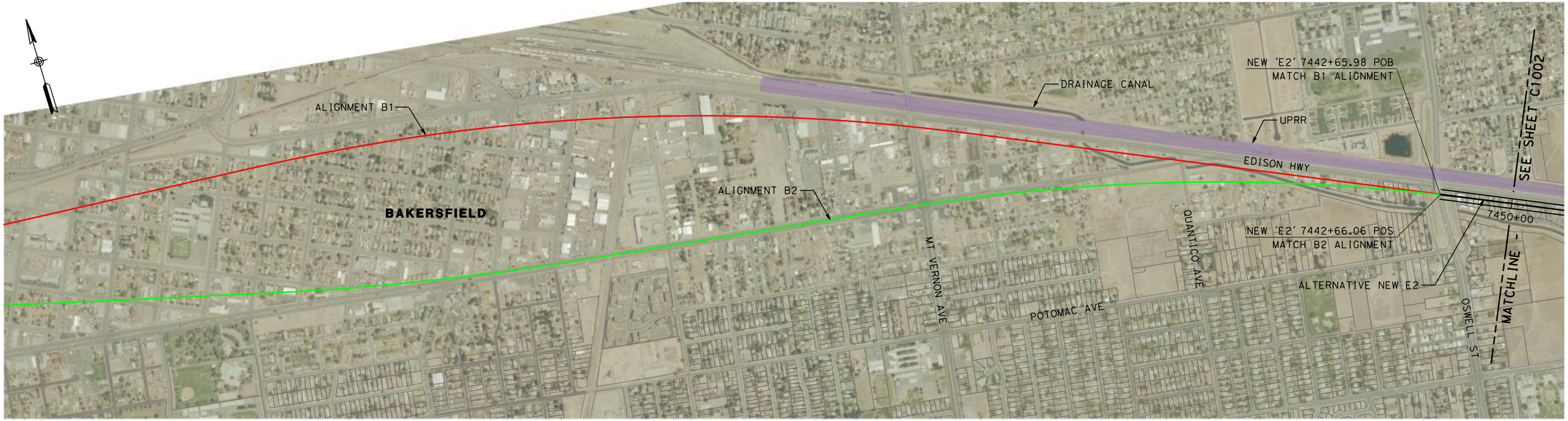
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
KEY MAP

DRAFT

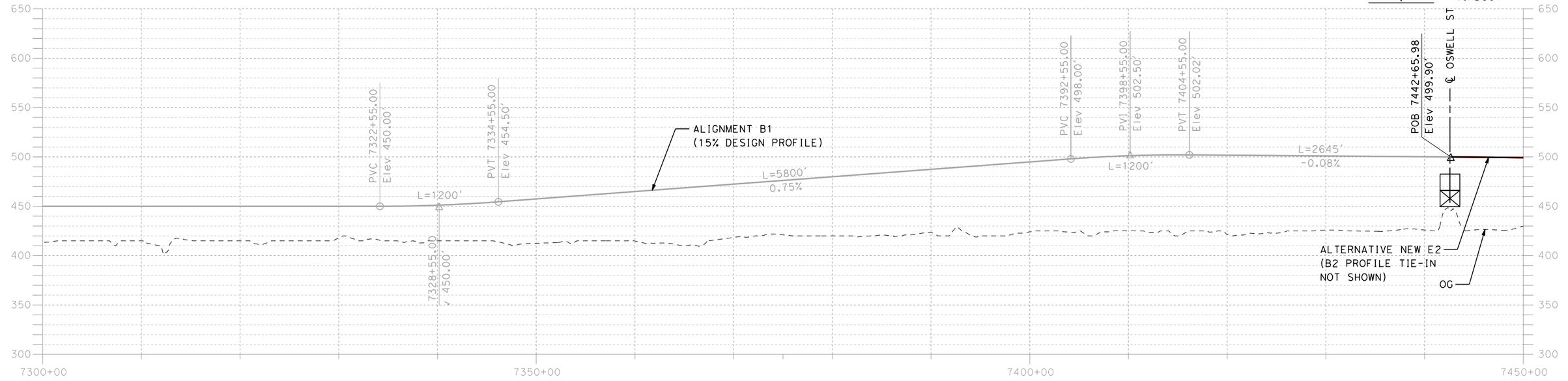
CONTRACT NO. HSR 06-0003
DRAWING NO. C1000
SCALE NOT TO SCALE
SHEET NO. 3 OF 51

12/12/2011 1:43:29 PM $FILEL$
MOR53804



PLAN

LEGEND:
UPRR ROW
VIADUCT



PROFILE

50 0 50 100 VER. 1"=50'

500 0 500 1000 HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. DEASON
DRAWN BY R. DEASON
CHECKED BY J. BINNING
IN CHARGE Q. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E2
EDISON
STA 7300+00 TO 7450+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1001
SCALE AS SHOWN
SHEET NO. 4 OF 51

12/12/2011 11:59:27 AM $FILEL$
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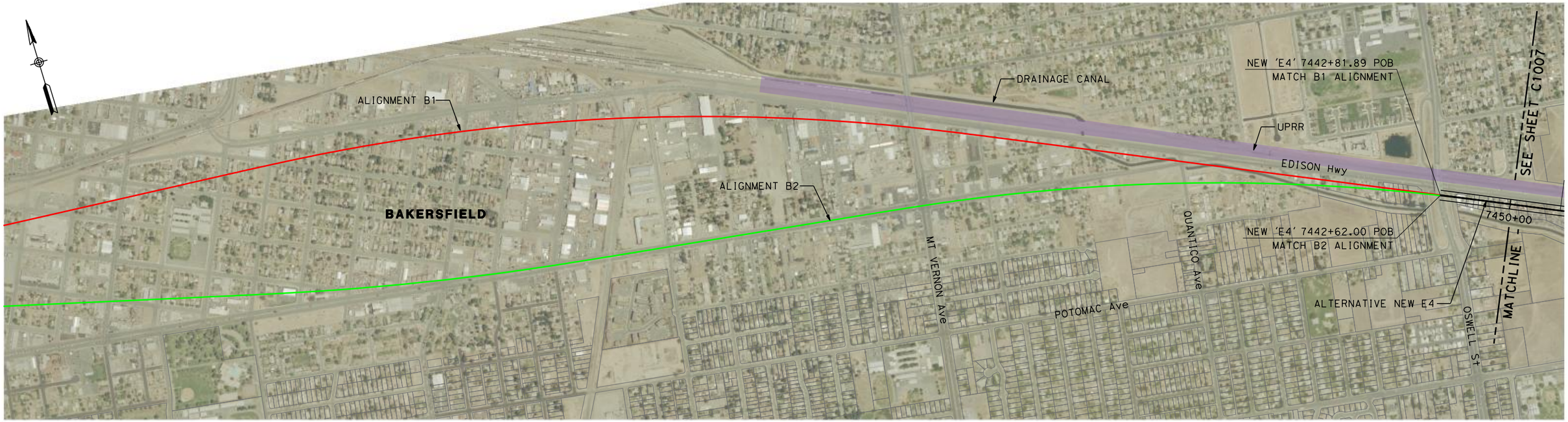
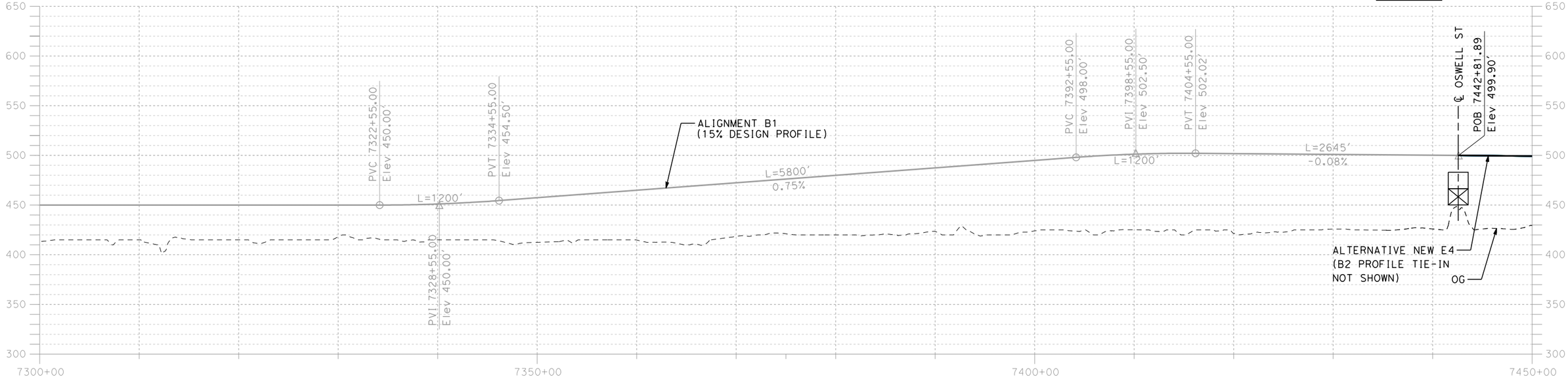


LEGEND:

UPRR ROW

VIADUCT

PLAN



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: J. NETTLETON
DRAWN BY: J. NETTLETON
CHECKED BY: J. BINNING
IN CHARGE: O.EARLE
DATE: 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
EDISON
STA 7300+00 TO 7450+00

DRAFT

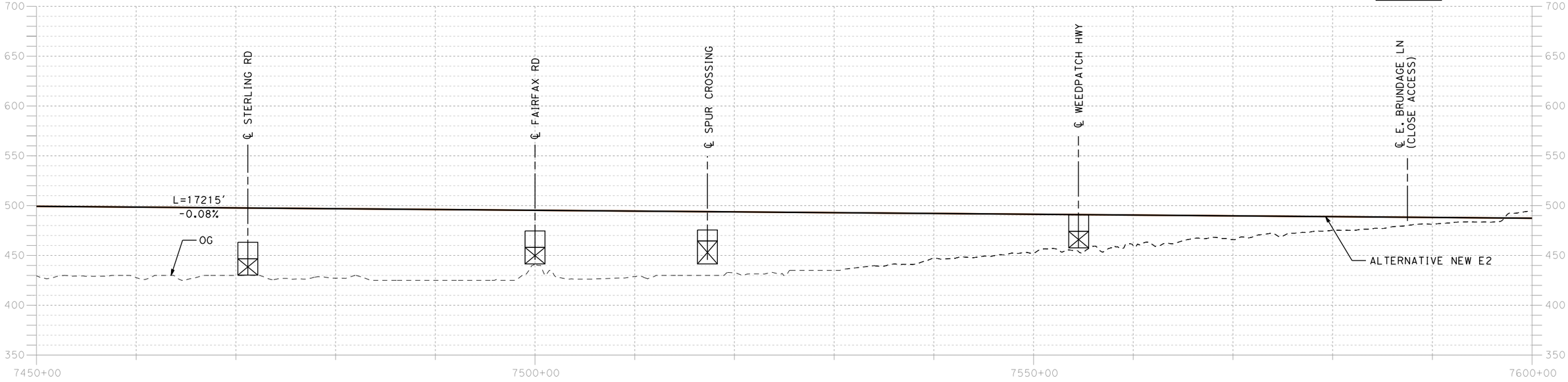
CONTRACT NO. HSR 06-0003
DRAWING NO. C1002
SCALE AS SHOWN
SHEET NO. 5 OF 51

12/12/2011 12:09:02 PM $FILEL$
MOR53804

PLAN

NOTE:
1. FOR SECTION A-A & B-B, SEE SHEET C3000.

LEGEND:
- UPRR ROW
- VIADUCT



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. DEASON
DRAWN BY R. DEASON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E2
EDISON
STA 7450+00 TO 7600+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1003
SCALE AS SHOWN
SHEET NO. 6 OF 51

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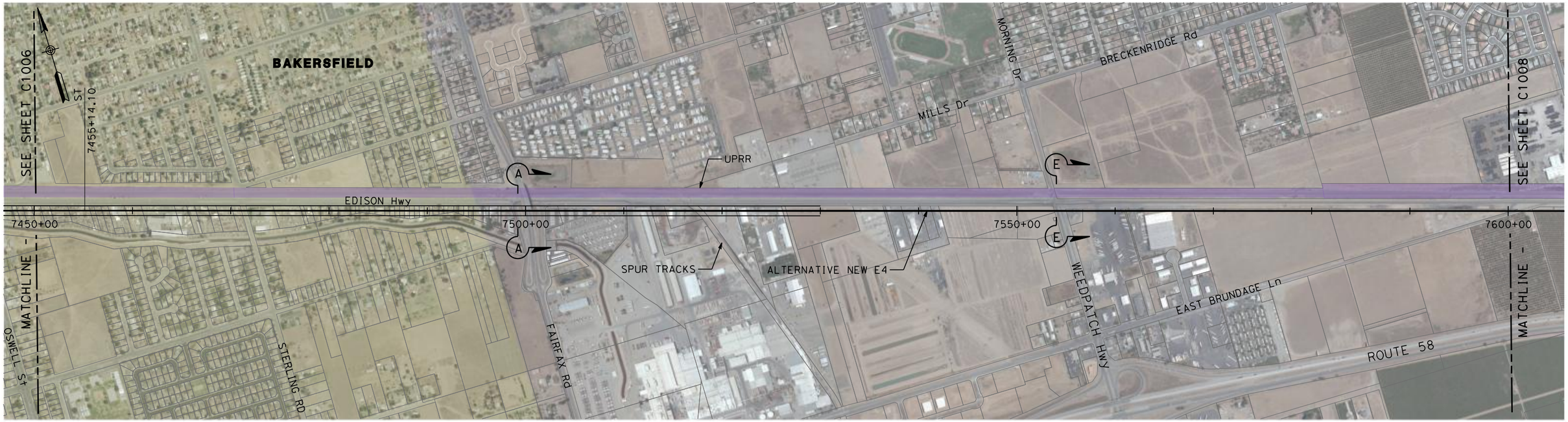


PLAN

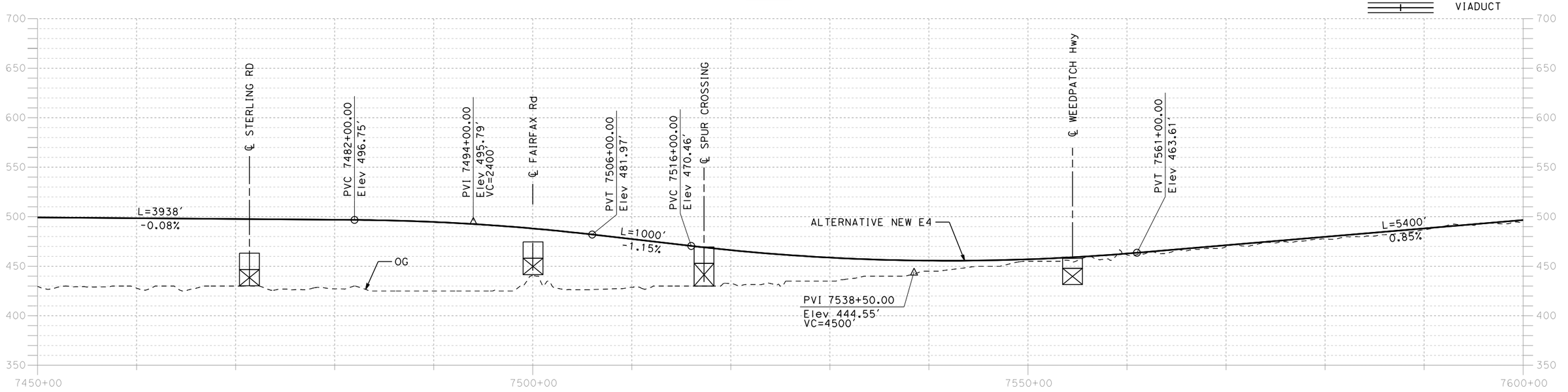
NOTE:

1. FOR SECTION A-A, SEE SHEET C3000.
2. FOR SECTION E-E, SEE SHEET C3001.

LEGEND:

UPRR ROW

VIADUCT



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY J. NETTLETON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

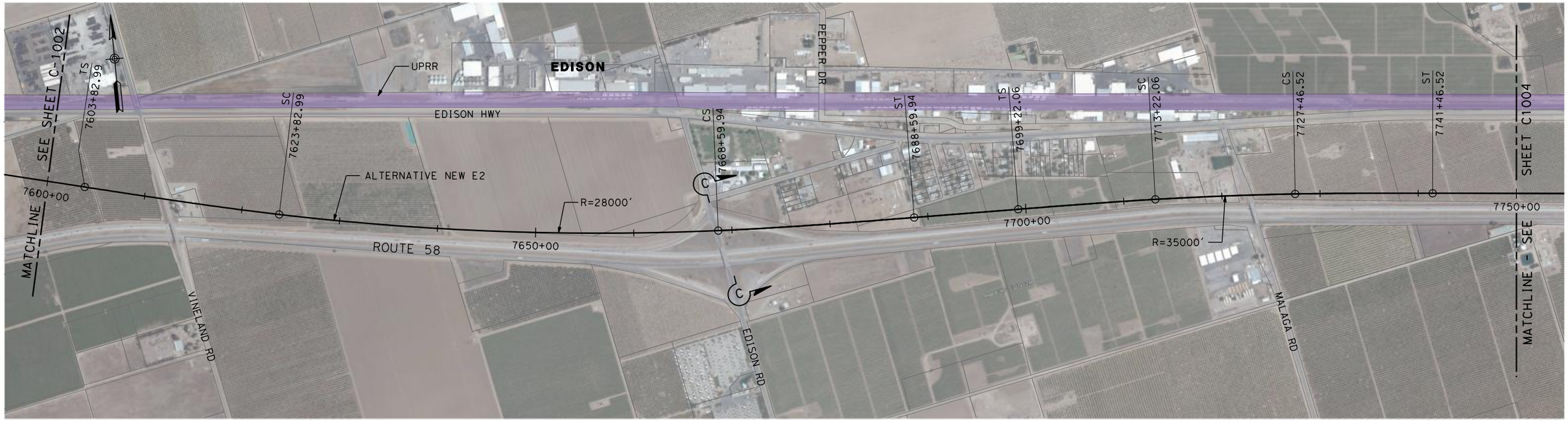
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
EDISON
STA 7450+00 TO 7600+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1004
SCALE AS SHOWN
SHEET NO. 7 OF 51

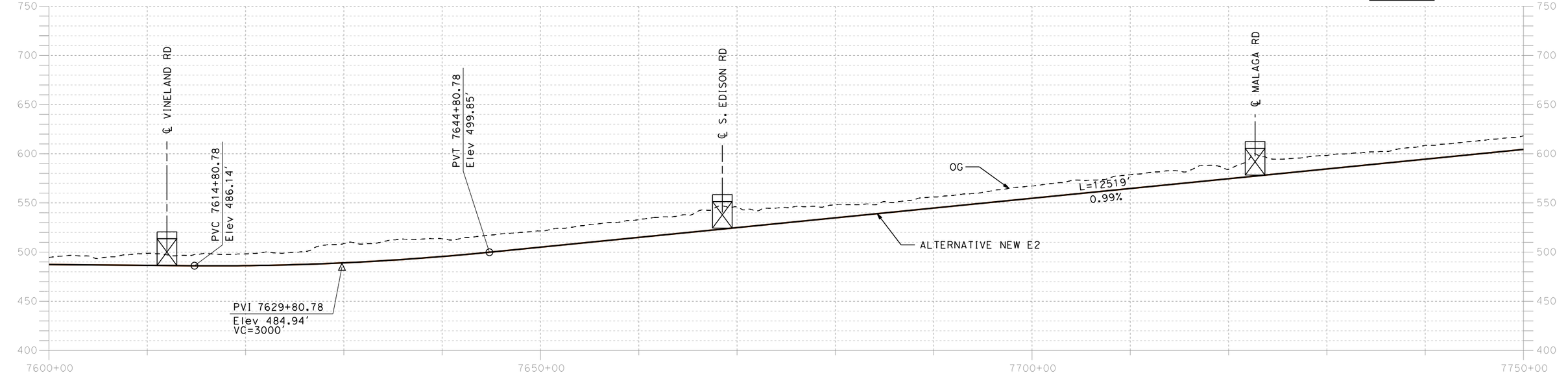
12/12/2011 12:11:16 PM $FILEL$
MOR53804



NOTE:
1. FOR SECTION C-C, SEE SHEET C3000.

LEGEND:
UPRR ROW
VIADUCT

PLAN



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. DEASON
DRAWN BY R. DEASON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E2
EDISON
STA 7600+00 TO 7750+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1005
SCALE AS SHOWN
SHEET NO. 8 OF 51

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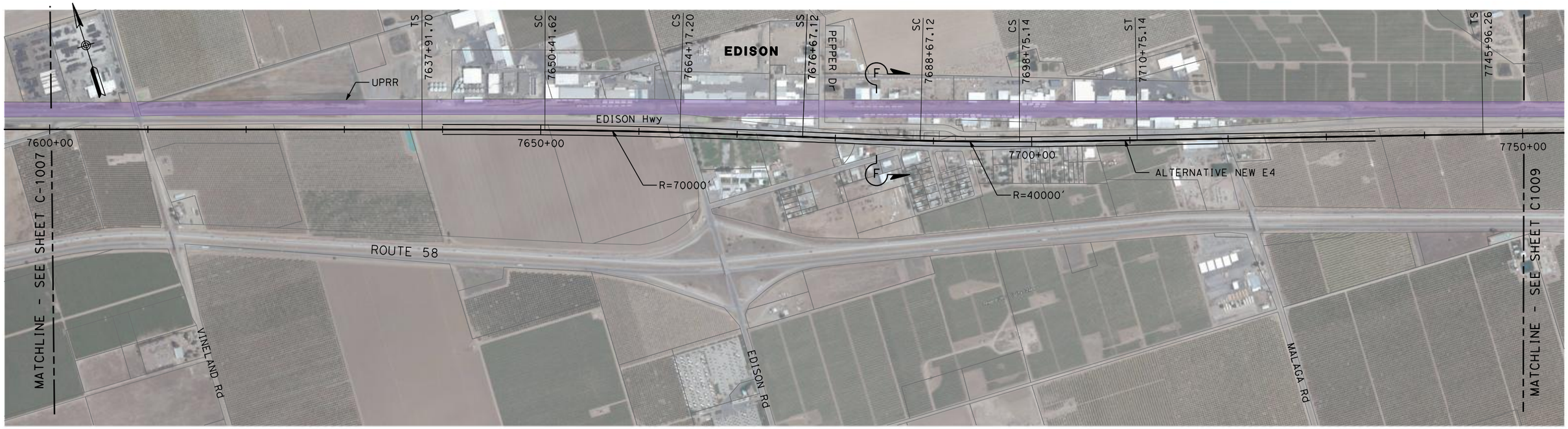
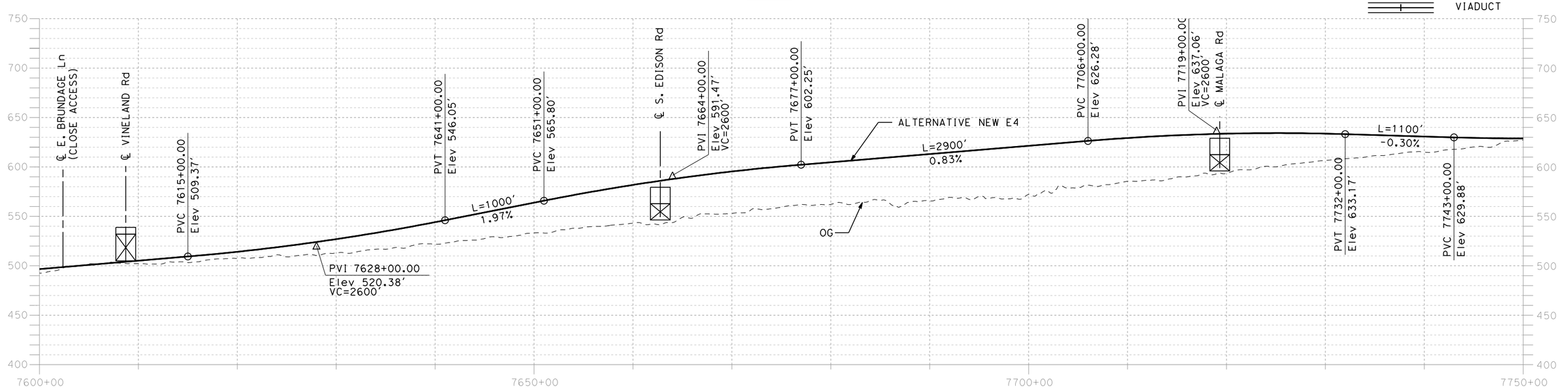


PLAN

NOTE:
1. FOR SECTION F-F, SEE SHEET C3001.

LEGEND:
UPRR ROW
VIADUCT



PROFILE

50 0 50 100 VER. 1"=50'
500 0 500 1000 HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY J. NETTLETON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
EDISON
STA 7600+00 TO 7750+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1006
SCALE AS SHOWN
SHEET NO. 9 OF 51

12/12/2011 12:13:16 PM $FILEL$
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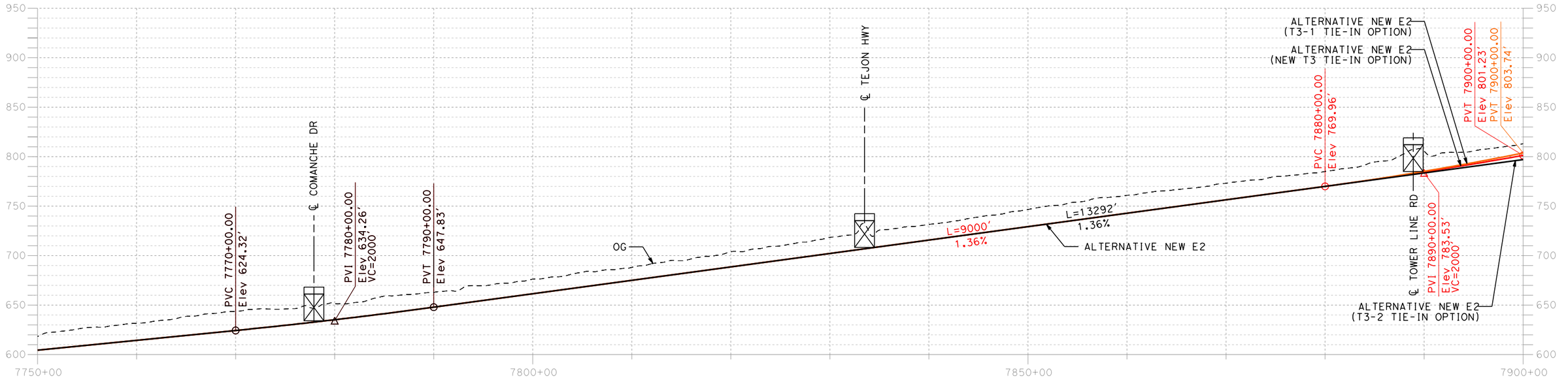
PLAN

NOTE:
1. FOR SECTION D-D, SEE SHEET C3001.

LEGEND:
UPRR ROW
VIADUCT



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. DEASON
DRAWN BY R. DEASON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E2
EDISON
STA 7750+00 TO 7900+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1007
SCALE AS SHOWN
SHEET NO. 10 OF 51

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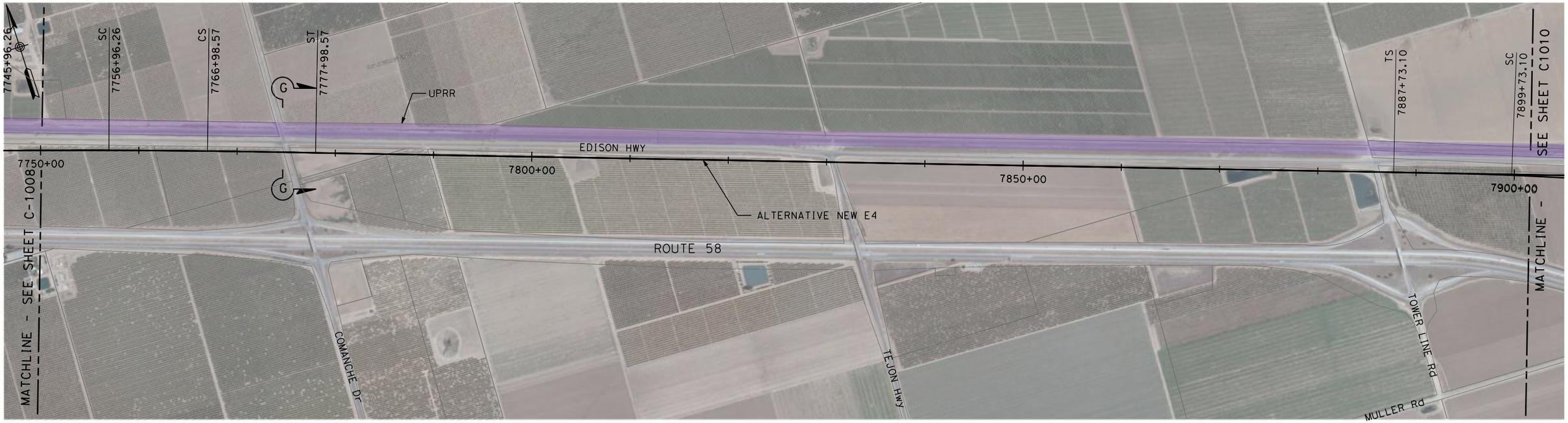


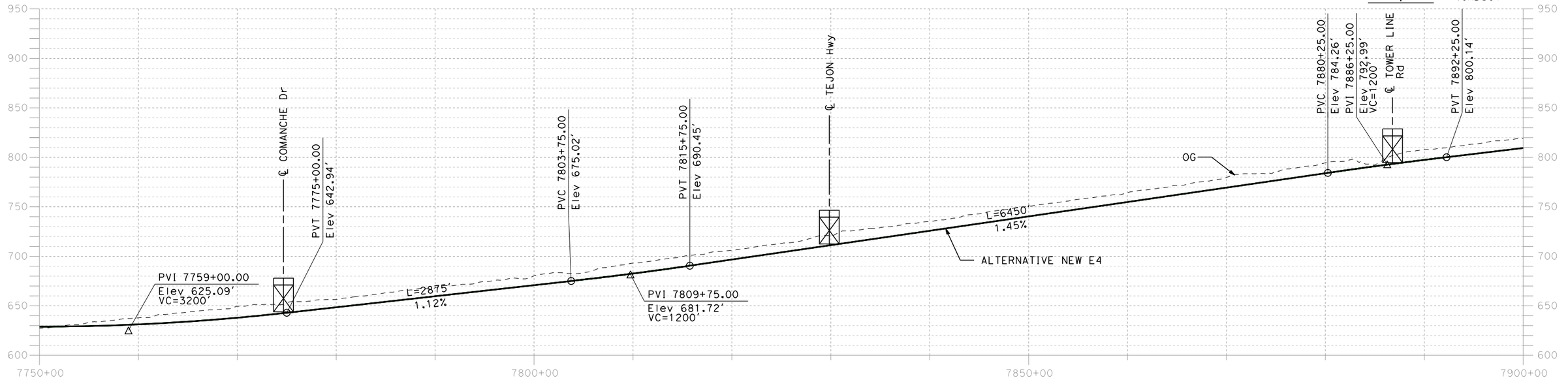
PLAN

NOTE:

1. FOR SECTION G-G, SEE SHEET C3002.

LEGEND:

- UPRR ROW
- VIADUCT



PROFILE

50 0 50 100 VER. 1"=50'

500 0 500 1000 HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY J. NETTLETON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
EDISON
STA 7750+00 TO 7900+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1008
SCALE AS SHOWN
SHEET NO. 11 OF 51

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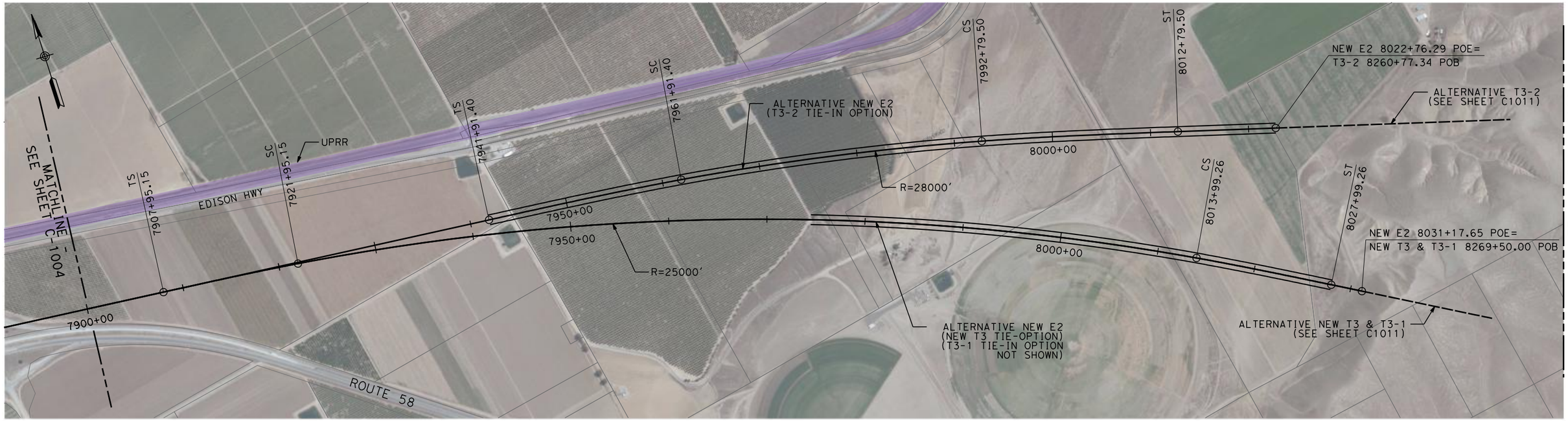
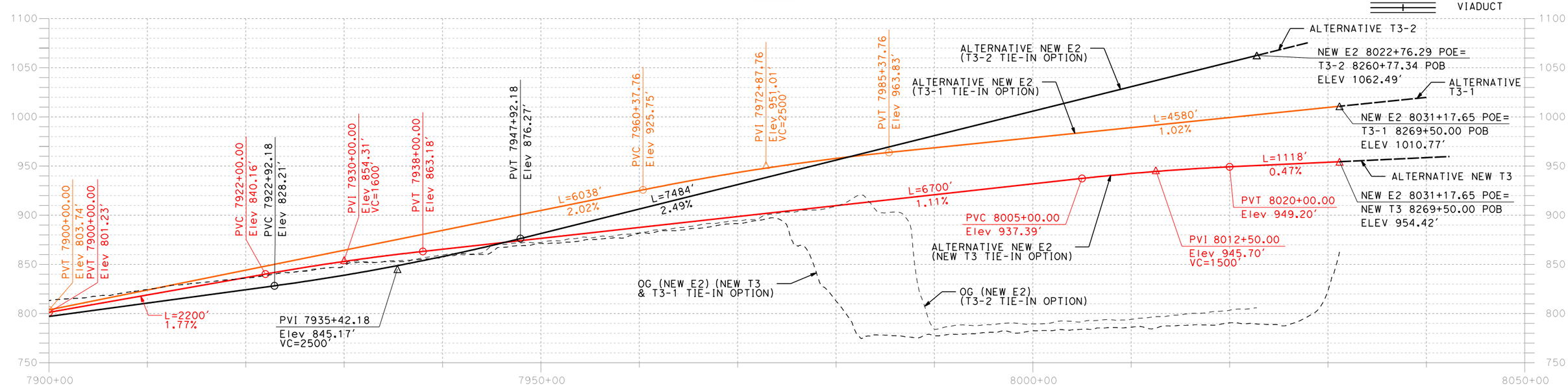


PLAN

LEGEND:

UPRR ROW

VIADUCT



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R. DEASON
DRAWN BY R. DEASON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E2
EDISON
STA 7900+00 TO 8050+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1009
SCALE AS SHOWN
SHEET NO. 12 OF 51

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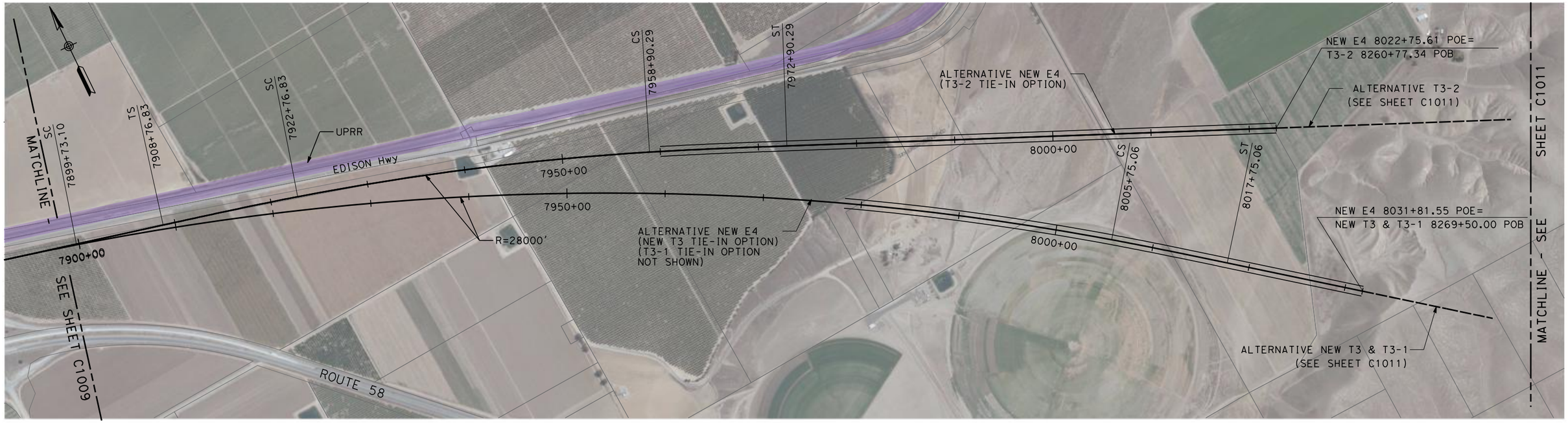
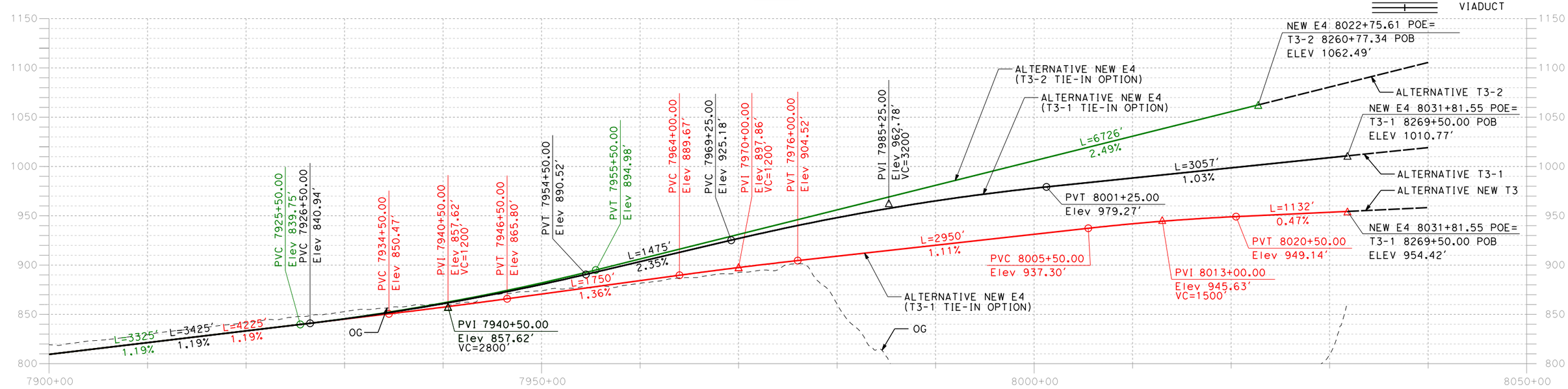


PLAN

LEGEND:
- UPRR ROW
- VIADUCT



PROFILE

VER. 1"=50' (50 0 50 100)
HOR. 1"=500' (500 0 500 1000)

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY J. NETTLETON
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
EDISON
STA 7900+00 TO 8050+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1010
SCALE AS SHOWN
SHEET NO. 13 OF 51

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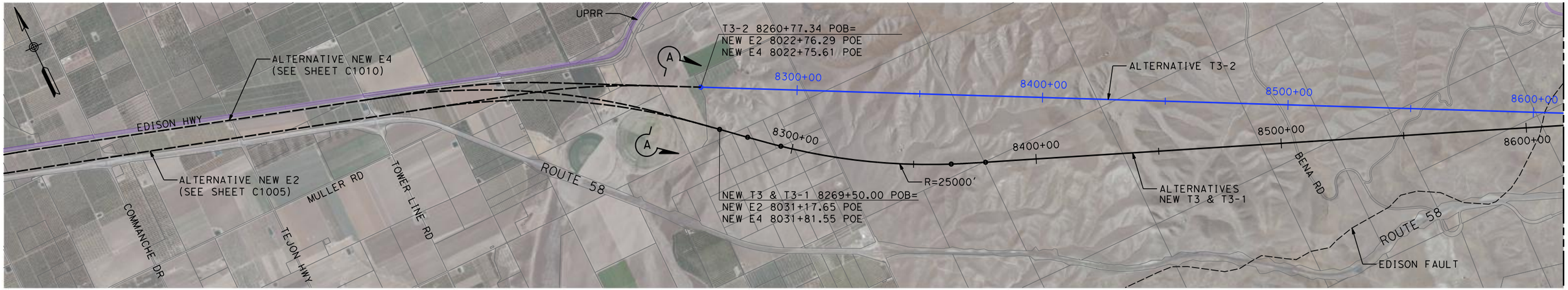


NOTE:

1. FOR SECTION A-A, SEE SHEET C3003.

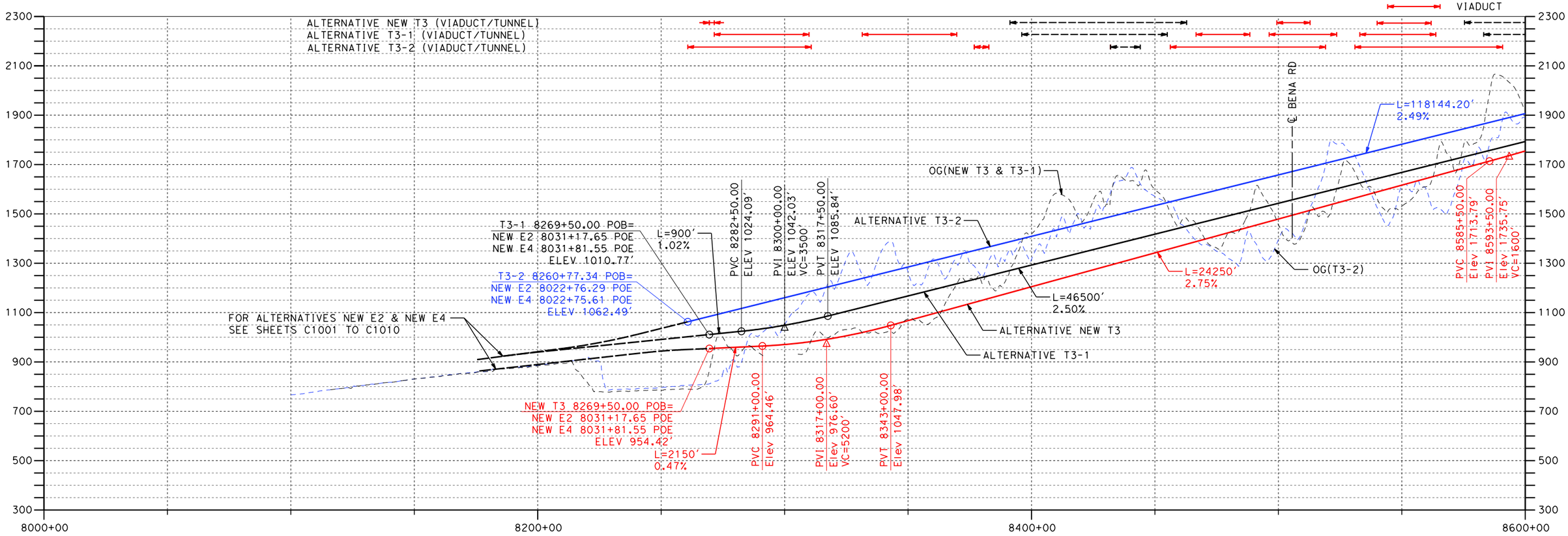
PLAN

LEGEND:

UPRR ROW

TUNNEL

VIADUCT



PROFILE

VER. 1"=200'

HOR. 1"=2000'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
TEHACHAPI
8000+00 TO 8600+00

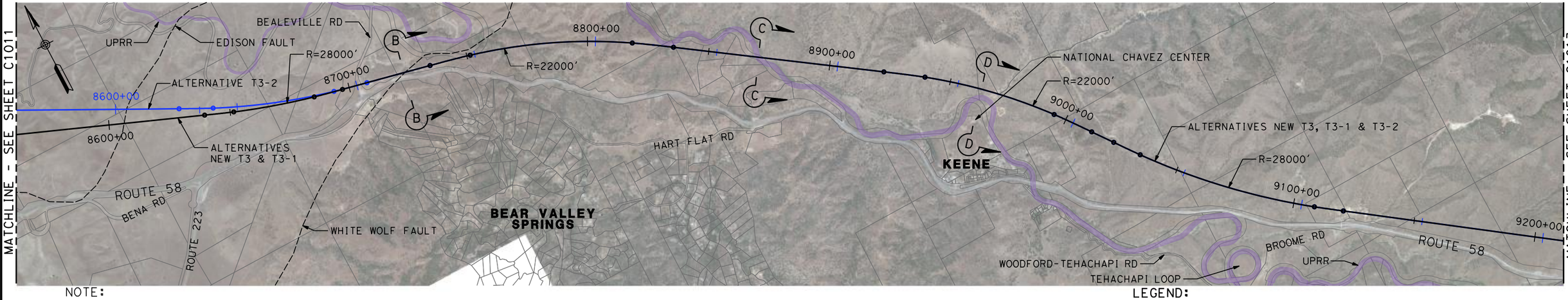
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1011
SCALE AS SHOWN
SHEET NO. 14 OF 51

BIN52529 7/26/2011 1:24:13 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\VA-Bakersfield to Palmdale\BP-C-1011.dgn

MATCHLINE - SEE SHEET C1011

MATCHLINE - SEE SHEET C1013



NOTE:

1. FOR SECTION B-B, SEE SHEET C3003. 2. FOR SECTION C-C & D-D, SEE SHEET C3004.

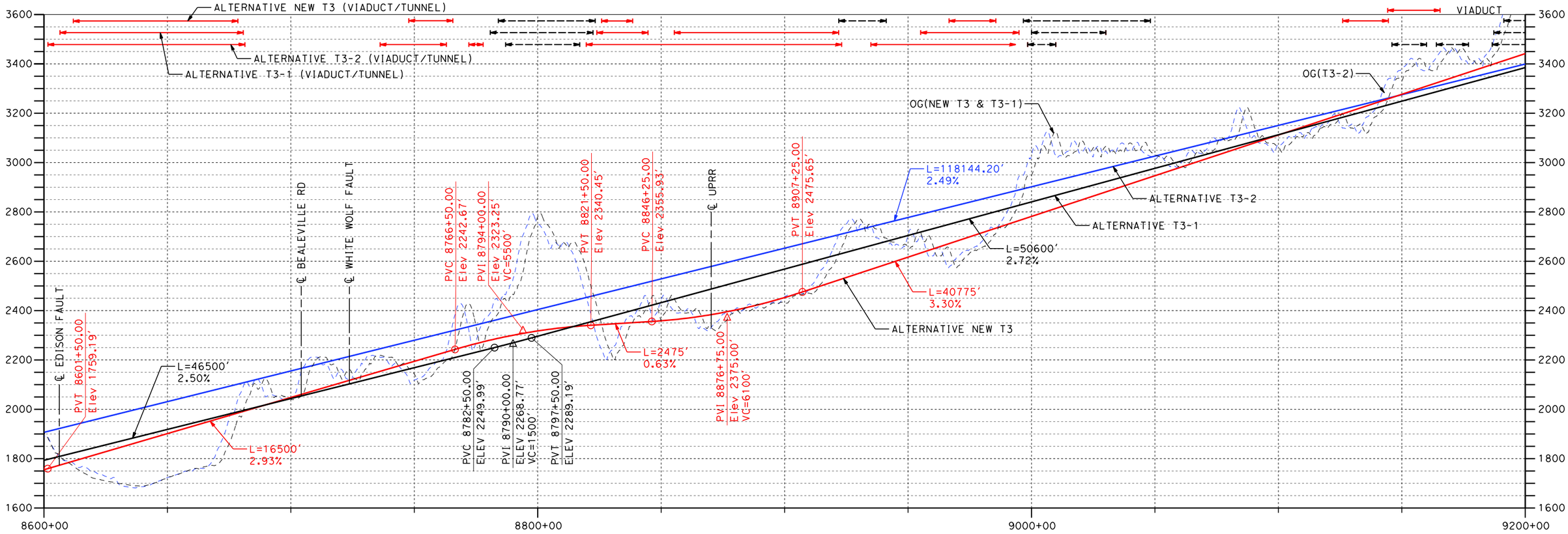
PLAN

LEGEND:

UPRR ROW

TUNNEL

VIADUCT



PROFILE

VER. 1"=200'

HOR. 1"=2000'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
TEHACHAPI
8600+00 TO 9200+00

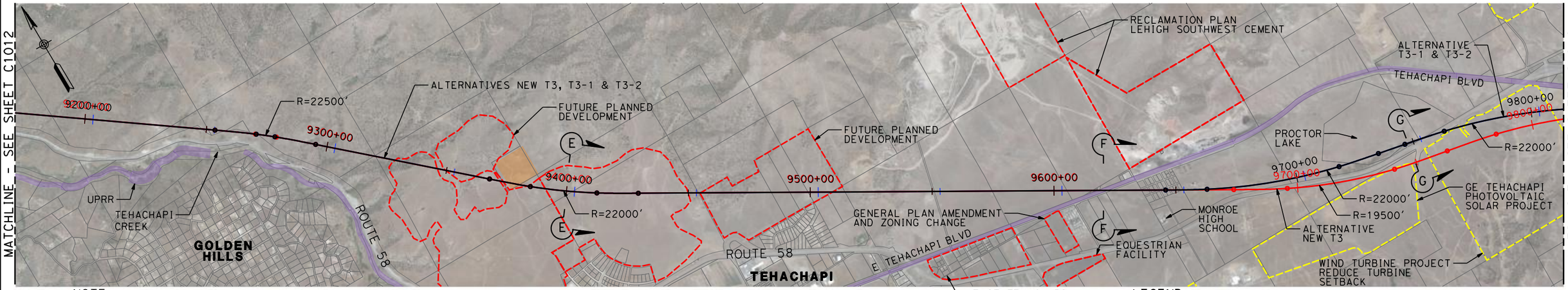
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1012
SCALE AS SHOWN
SHEET NO. 15 OF 51

BIN52529 7/26/2011 1:27:25 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1012.dgn

MATCHLINE - SEE SHEET C1012

MATCHLINE - SEE SHEET C1014



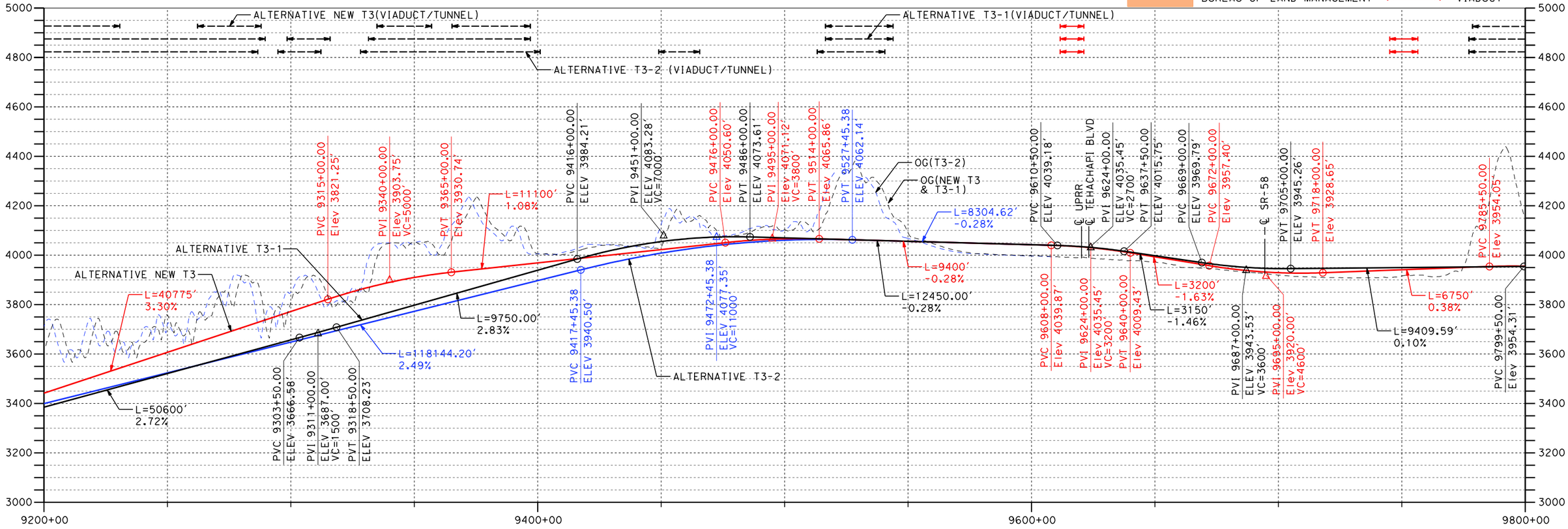
NOTE:

1. FOR SECTION E-E & F-F, SEE SHEET C3005. 2. FOR SECTION G-G, SEE SHEET C3006.

PLAN

LEGEND:

- UPRR ROW
- BUREAU OF LAND MANAGEMENT
- TUNNEL
- VIADUCT



PROFILE

VER. 1"=200' (200 0 200 400)

HOR. 1"=2000' (2000 0 2000 4000)

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

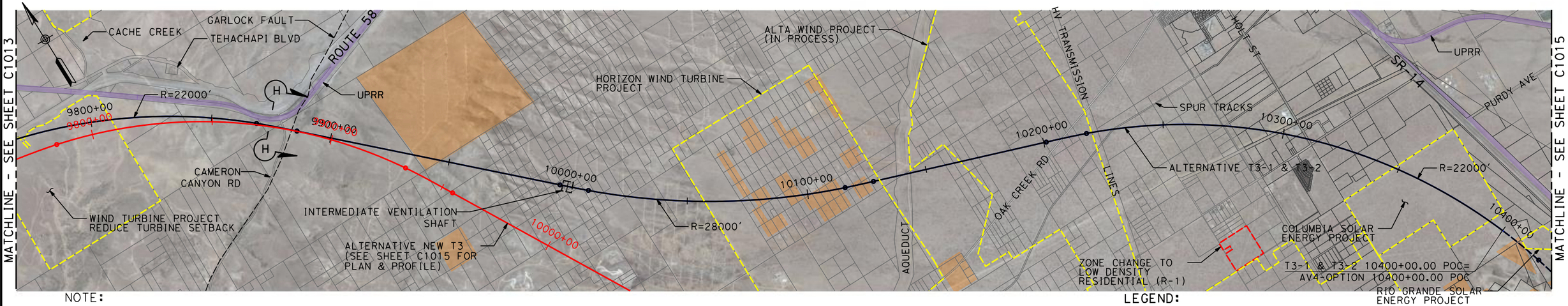
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
TEHACHAPI
9200+00 TO 9800+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1013
SCALE AS SHOWN
SHEET NO. 16 OF 51

7/26/2011 11:12:43 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1013.dgn

BIN52529



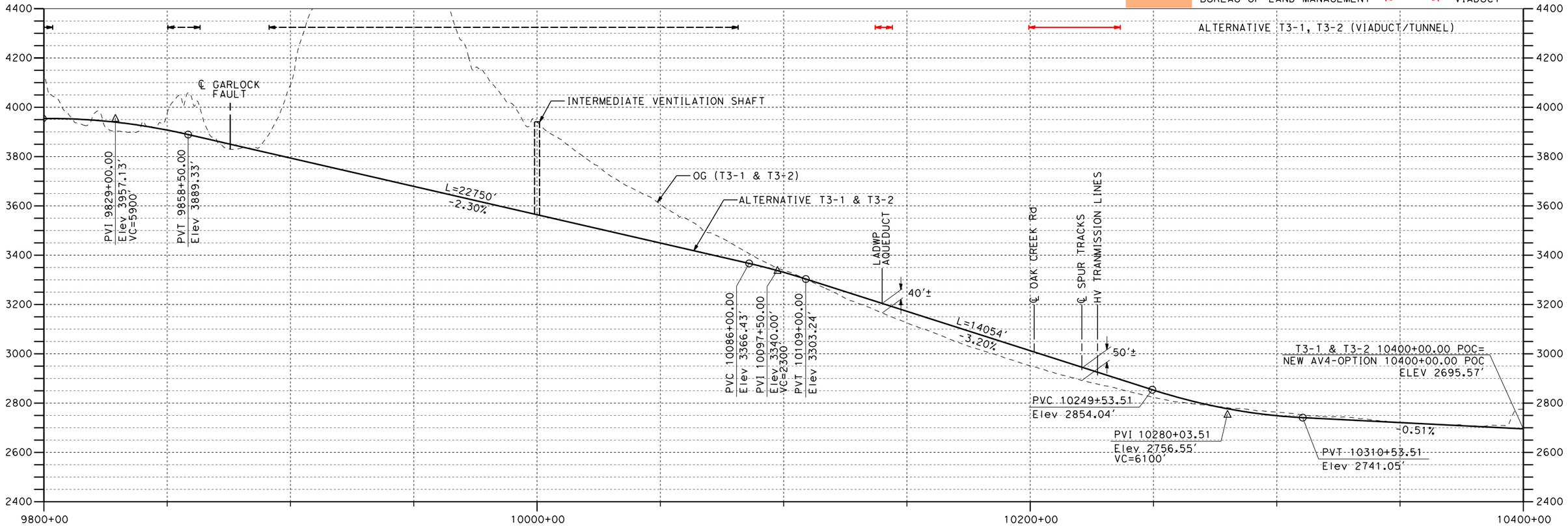
NOTE:

1. FOR SECTION H-H, SEE SHEET C3006.

PLAN

LEGEND:

- UPRR ROW
- BUREAU OF LAND MANAGEMENT
- TUNNEL
- VIADUCT



PROFILE

200 0 200 400 VER. 1"=200'

2000 0 2000 4000 HOR. 1"=2000'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

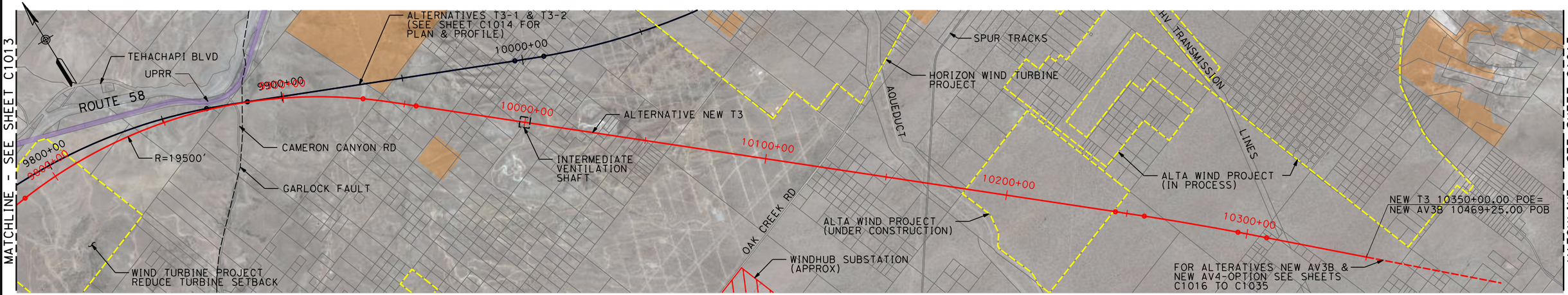
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
TEHACHAPI
9800+00 TO 10400+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1014
SCALE AS SHOWN
SHEET NO. 17 OF 51

BIN52529 7/26/2011 1:15:20 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1014.dgn

MATCHLINE - SEE SHEET C1013

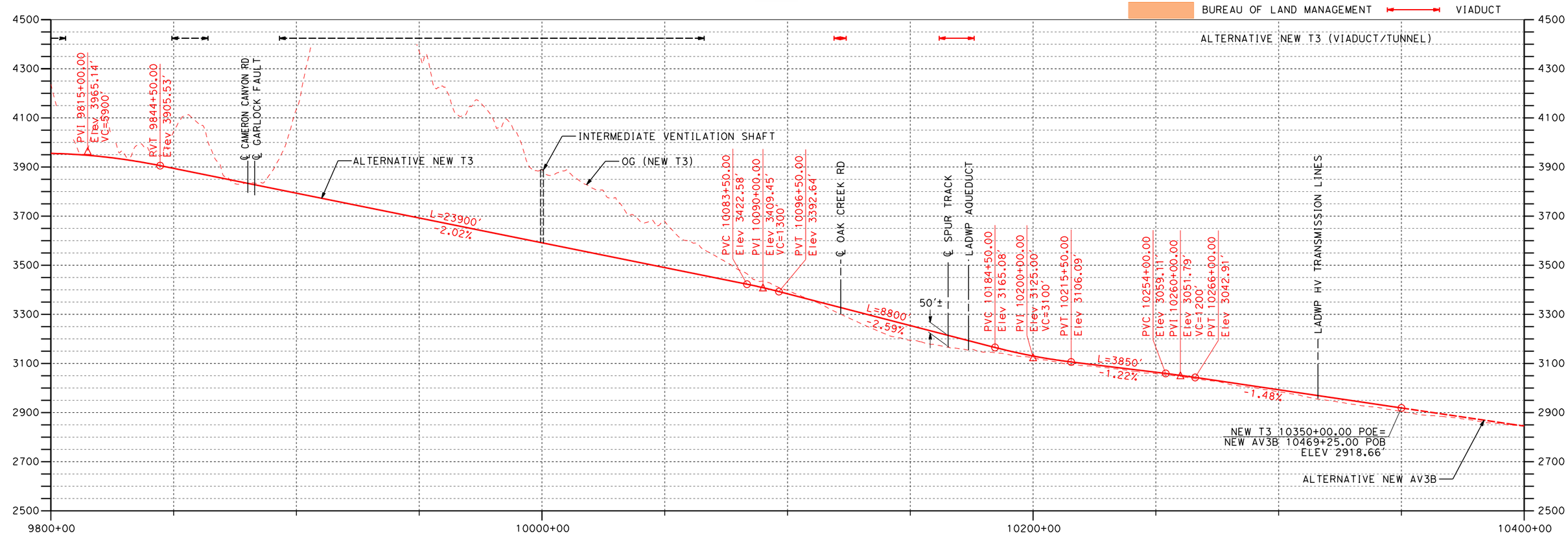
MATCHLINE - SEE SHEET C1015



PLAN

LEGEND:

- UPRR ROW
- BUREAU OF LAND MANAGEMENT
- TUNNEL
- VIADUCT



PROFILE

200 0 200 400 VER. 1"=200'

2000 0 2000 4000 HOR. 1"=2000'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	J. NETTLETON
DRAWN BY	T. PRETZER
CHECKED BY	J. BINNING
IN CHARGE	Q. EARLE
DATE	07/26/11

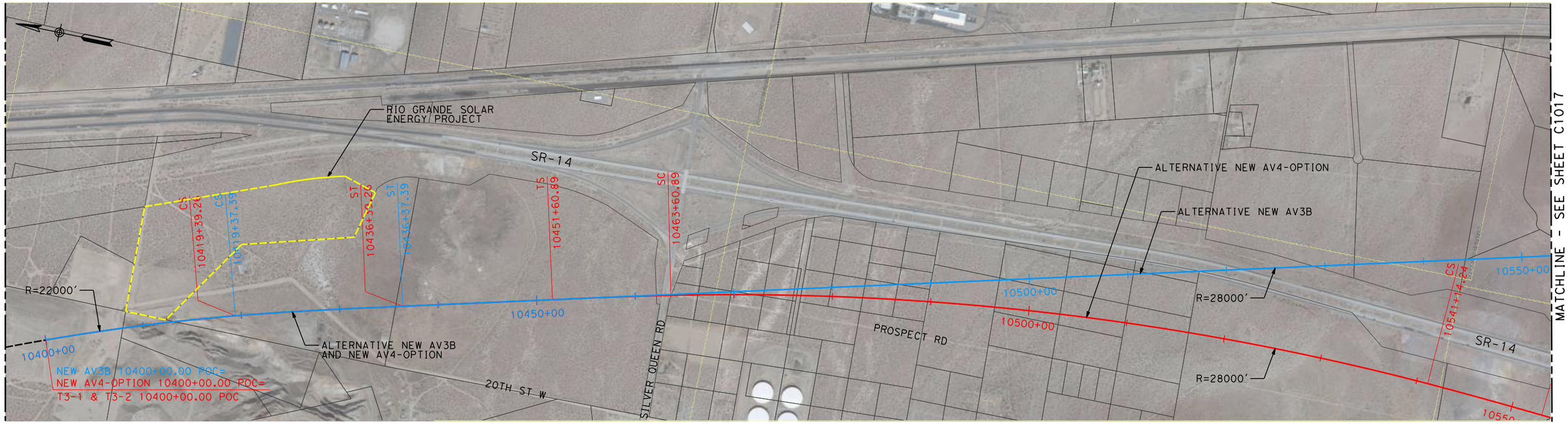
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

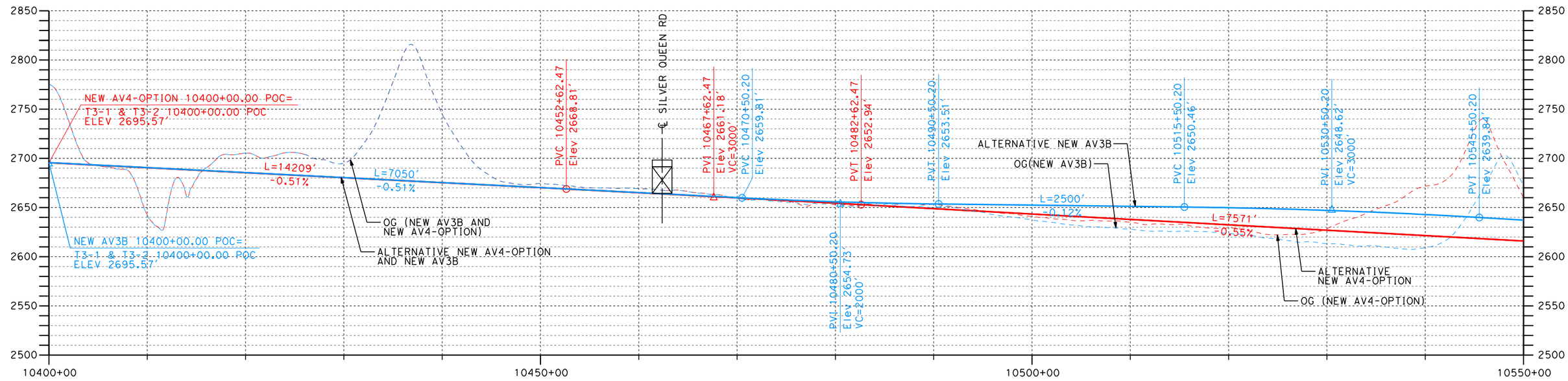
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
TEHACHAPI
9800+00 TO 10400+00

DRAFT

CONTRACT NO.	HSR 06-0003
DRAWING NO.	C1015
SCALE	AS SHOWN
SHEET NO.	18 OF 51



PLAN



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

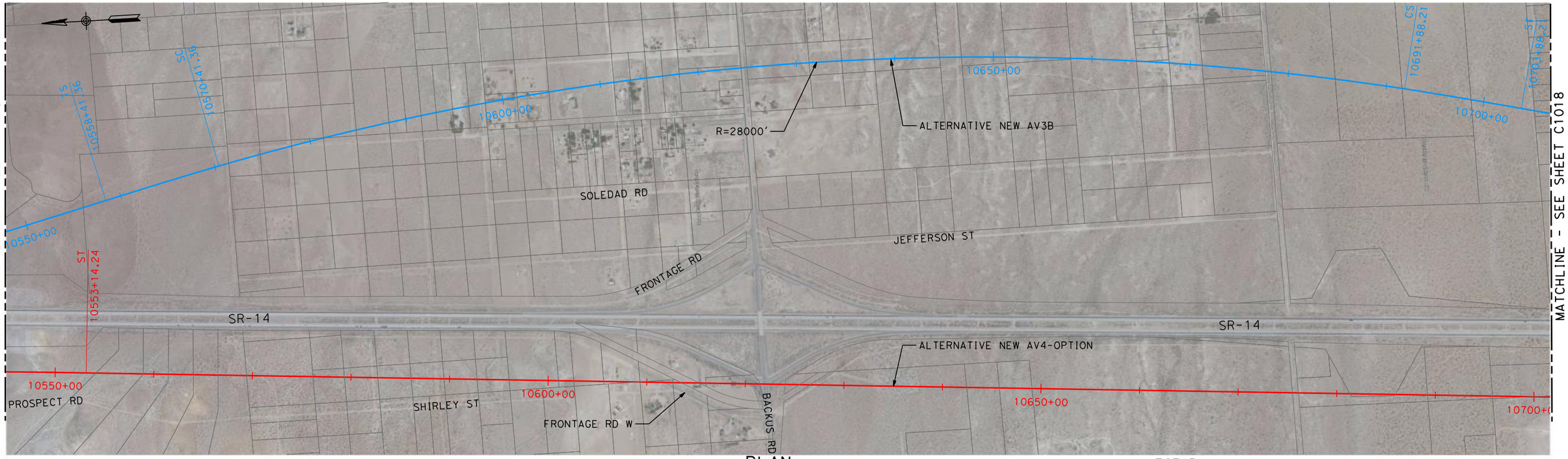
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

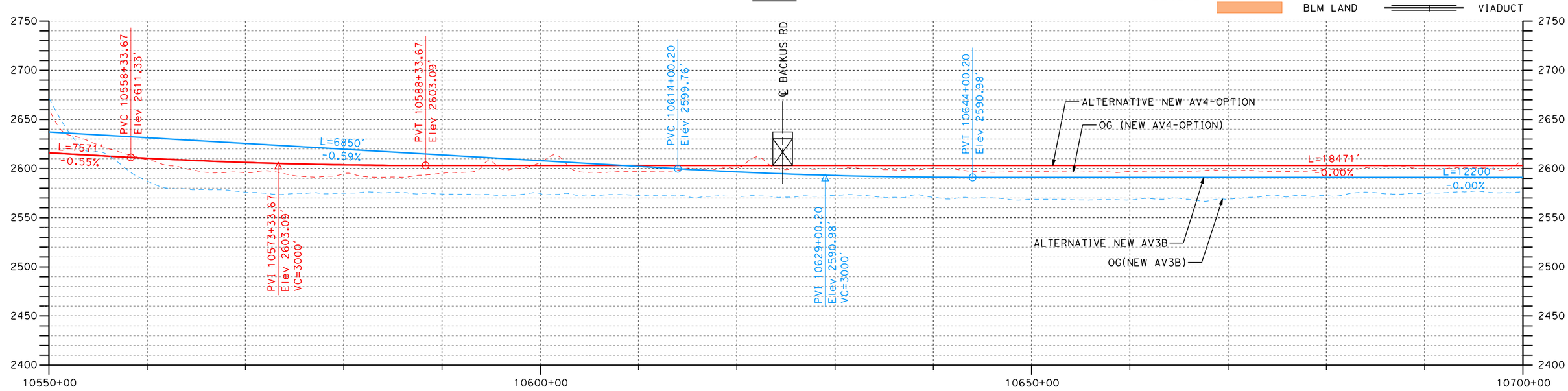
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10400+00 TO 10550+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1016
SCALE AS SHOWN
SHEET NO. 19 OF 51

9/6/2011 12:42:00 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1016.dgn
MOR53804





PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE

ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10550+00 TO 10700+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1017
SCALE AS SHOWN
SHEET NO. 20 OF 51

MOR53804 9/6/2011 1:48:40 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1017.dgn

MATCHLINE - SEE SHEET C1017

MATCHLINE - SEE SHEET C1022

ALTERNATIVE NEW AV3B

ALTERNATIVE NEW AV4-OPTION

SR-14

SR-14

R=45000'

R=45000'

UPRR

DAWN RD

CHAMPAGNE AVE

20TH ST W

FRONTAGE RD

10700+00

10750+00

10800+00

10850+00

TS 10777+43.53

SC 10792+43.53

TS 10799+56.15

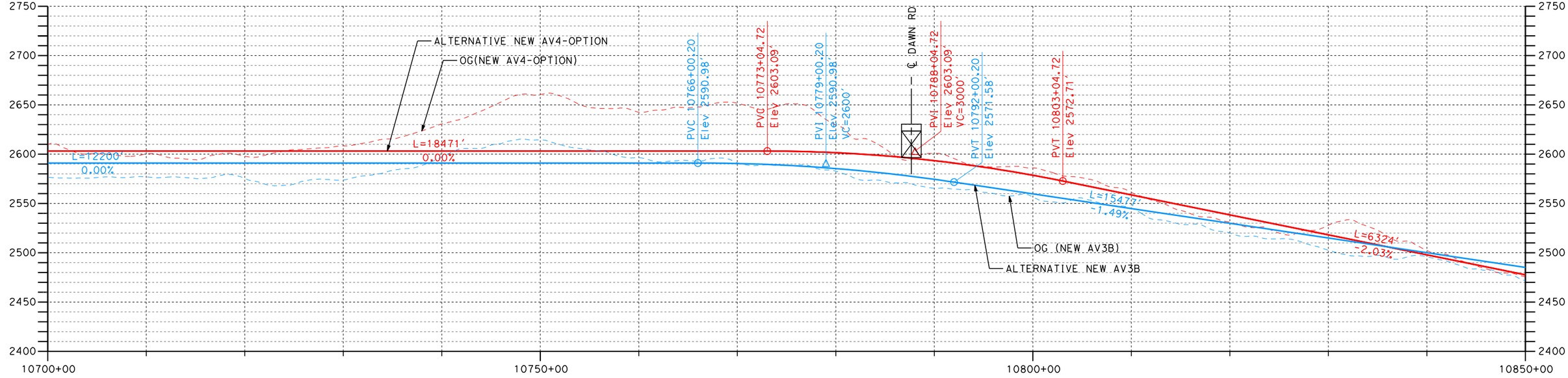
SC 10817+56.15

PLAN

LEGEND:

UPPR ROW

VIADUCT



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

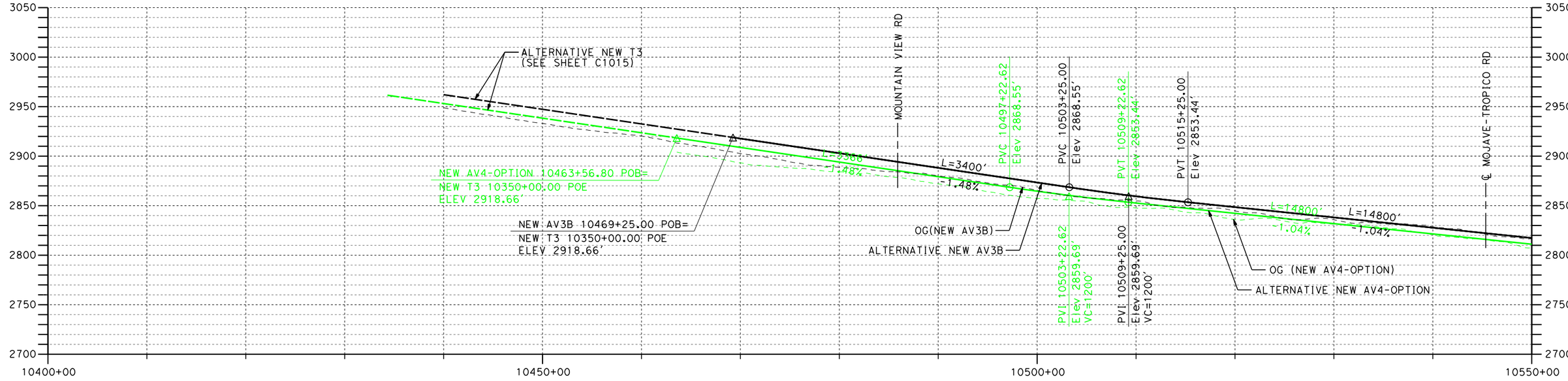
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10700+00 TO 10850+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1018
SCALE AS SHOWN
SHEET NO. 21 OF 51

MOR53804 9/6/2011 1:45:24 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1018.dgn

PLAN



PROFILE

VER. 1"=50'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10469+25 TO 10550+00

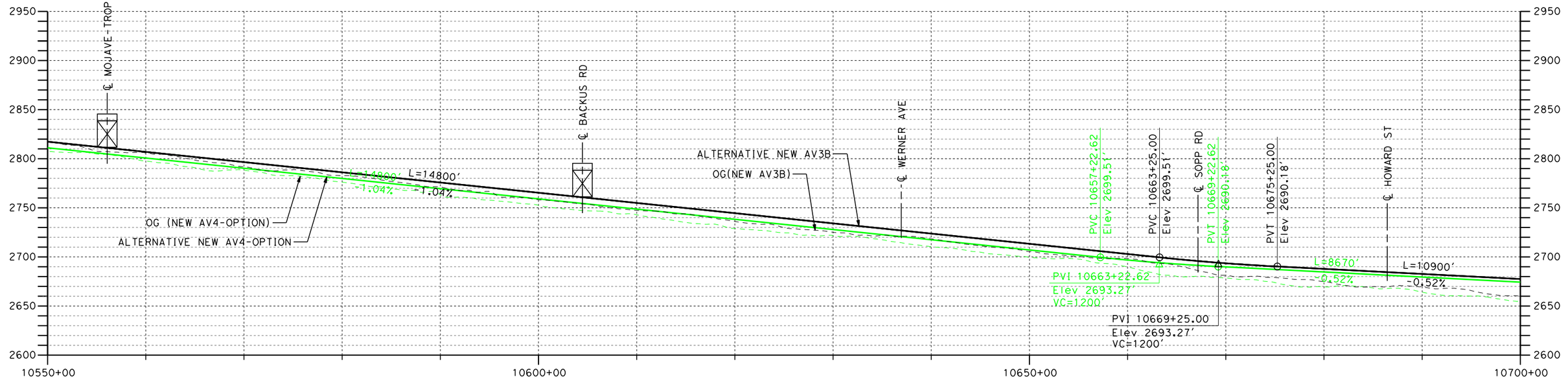
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1019
SCALE AS SHOWN
SHEET NO. 22 OF 51

9/6/2011 1:42:56 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1019.dgn
MOR53804

PLAN

LEGEND:
- UPPR ROW
- BLM LAND
- VIADUCT



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

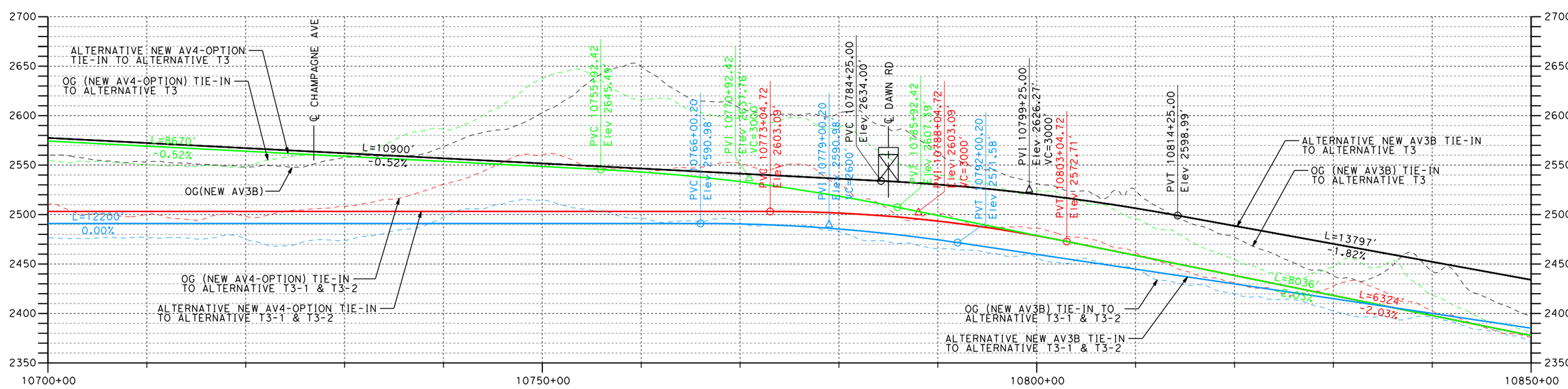
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10550+00 TO 10700+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1020
SCALE AS SHOWN
SHEET NO. 23 OF 51

9/6/2011 12:54:04 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1020.dgn
MOR53804

PLAN



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10700+00 TO 10850+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1021
SCALE AS SHOWN
SHEET NO. 24 OF 51

9/6/2011 1:53:20 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1021.dgn
MOR53804

PLAN

PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

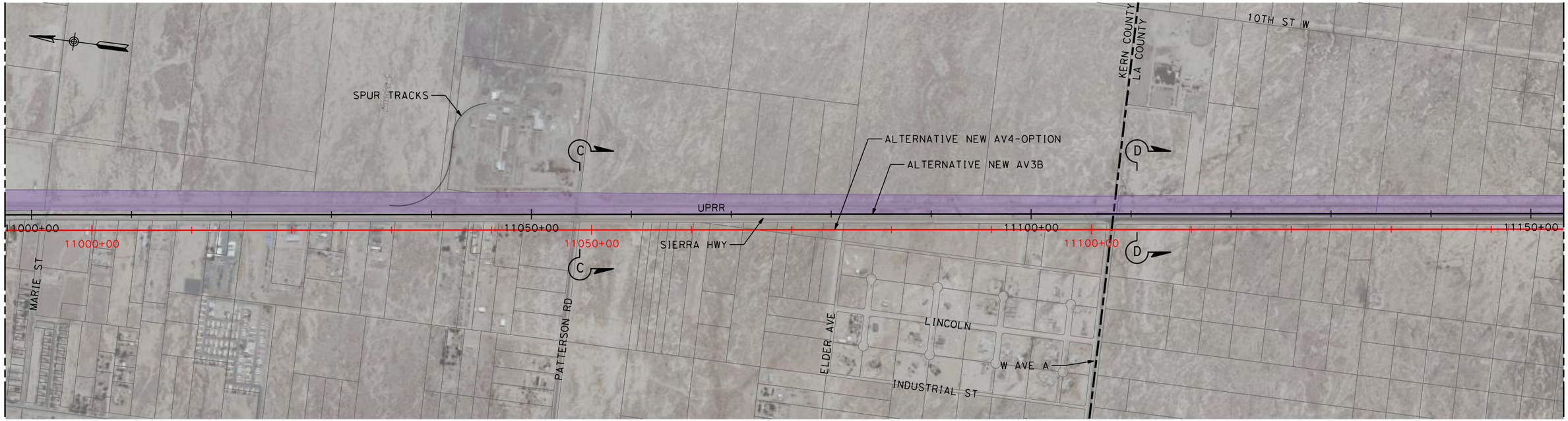
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 10850+00 TO 11000+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1022
SCALE AS SHOWN
SHEET NO. 25 OF 51

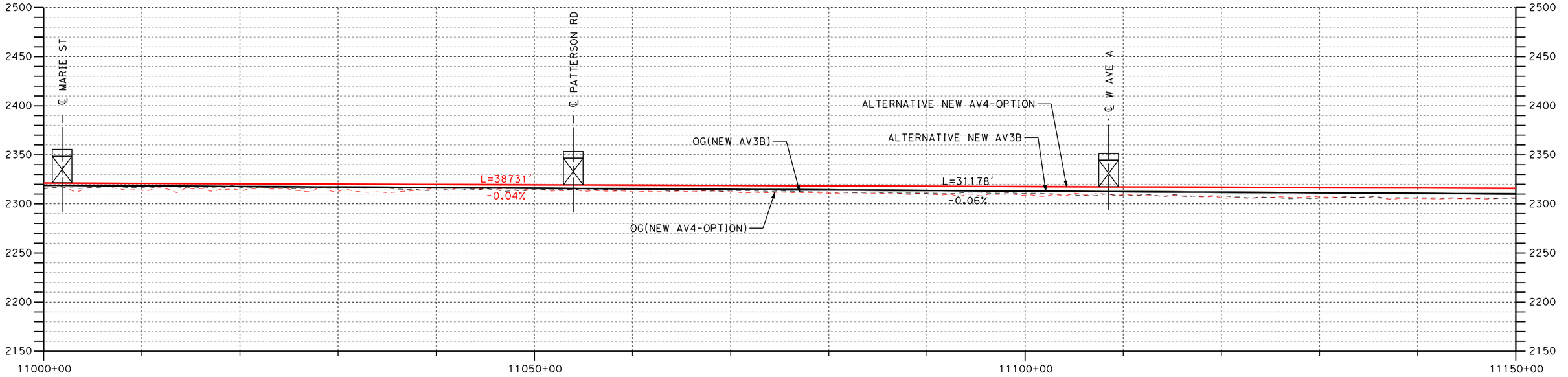
9/6/2011 1:27:36 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1022.dgn
MOR53804



PLAN

NOTE:
1. FOR SECTION C-C, SEE SHEET C3007.
2. FOR SECTION D-D, SEE SHEET C3008.

LEGEND:
UPRR ROW
VIADUCT



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

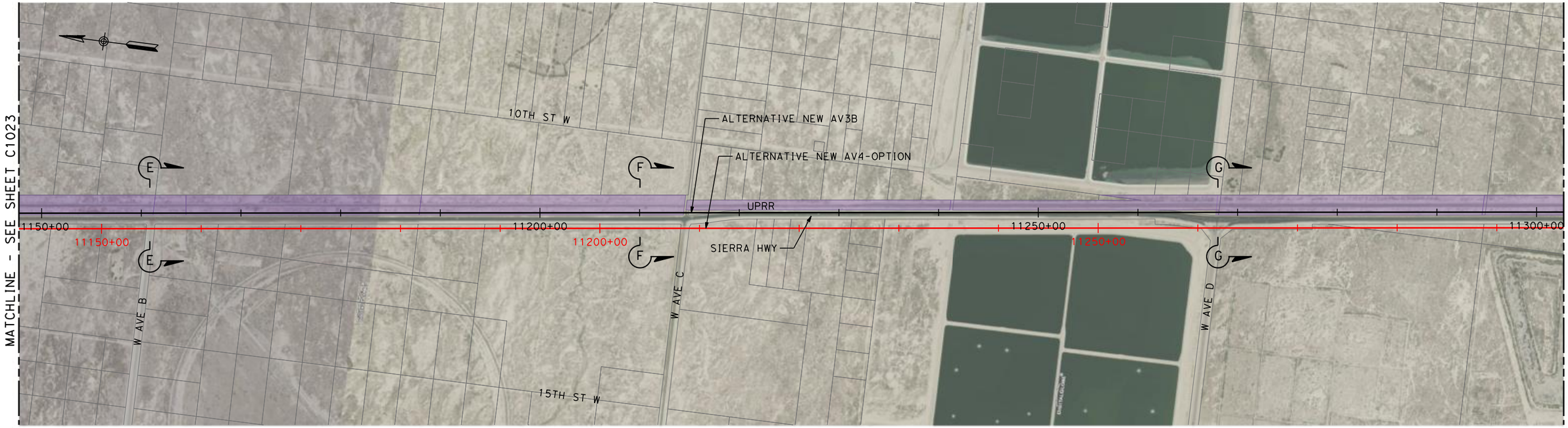
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11000+00 TO 11150+00

DRAFT

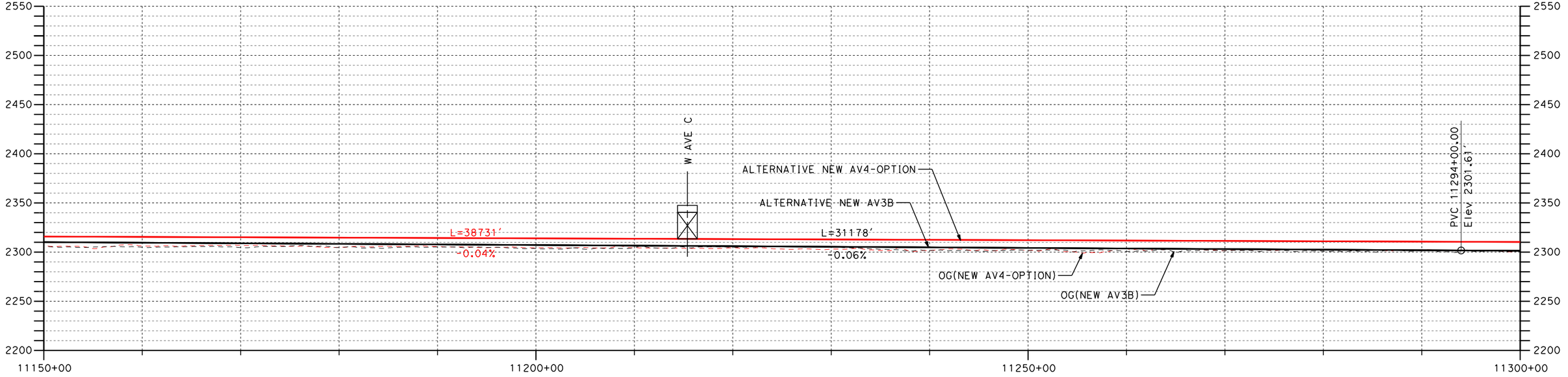
CONTRACT NO. HSR 06-0003
DRAWING NO. C1023
SCALE AS SHOWN
SHEET NO. 26 OF 51



PLAN

NOTE:
1. FOR SECTION E-E & F-F, SEE SHEET C3008.
2. FOR SECTION G-G, SEE SHEET C3009.

LEGEND:
UPRR ROW



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

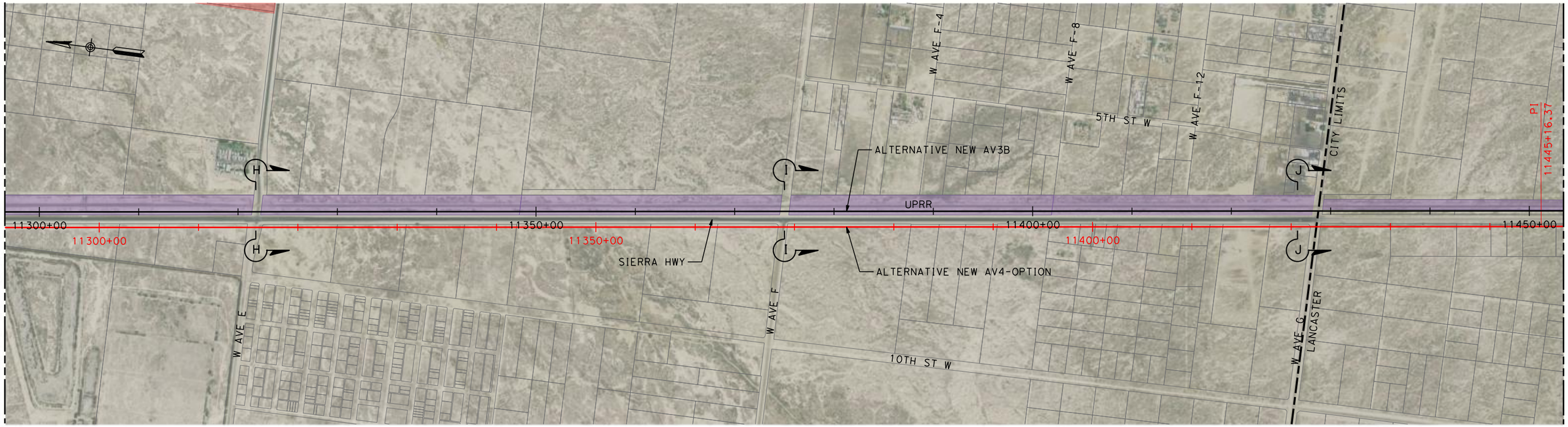
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11150+00 TO 11300+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1024
SCALE AS SHOWN
SHEET NO. 27 OF 51

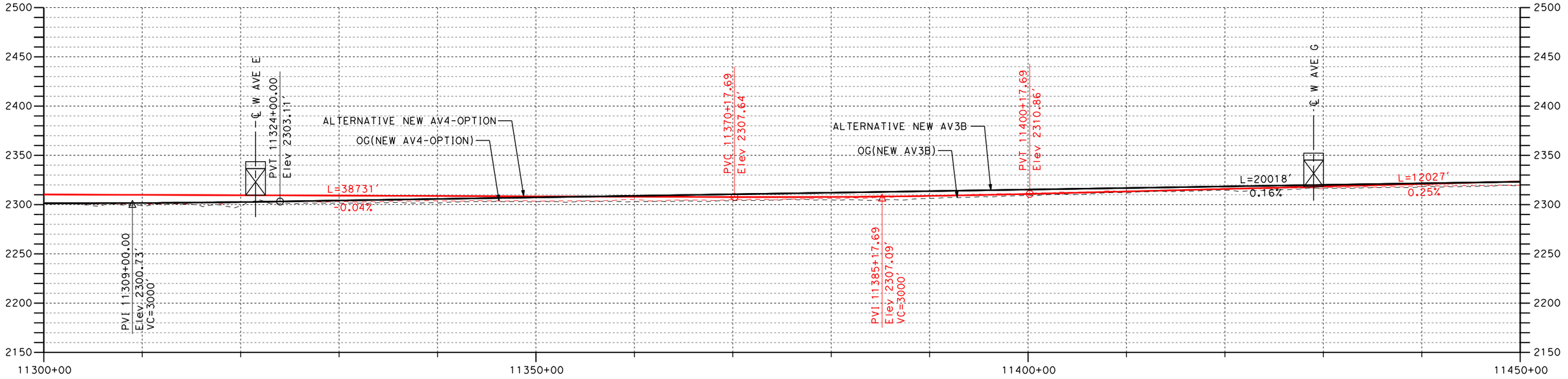
7/26/2011 7:48:42 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1024.dgn
MOR53804



PLAN

NOTE:
1. FOR SECTION H-H & I-I, SEE SHEET C3009.
2. FOR SECTION J-J, SEE SHEET C3010.

LEGEND:
MILITARY LAND
UPRR ROW



PROFILE

VER. 1"=50'
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

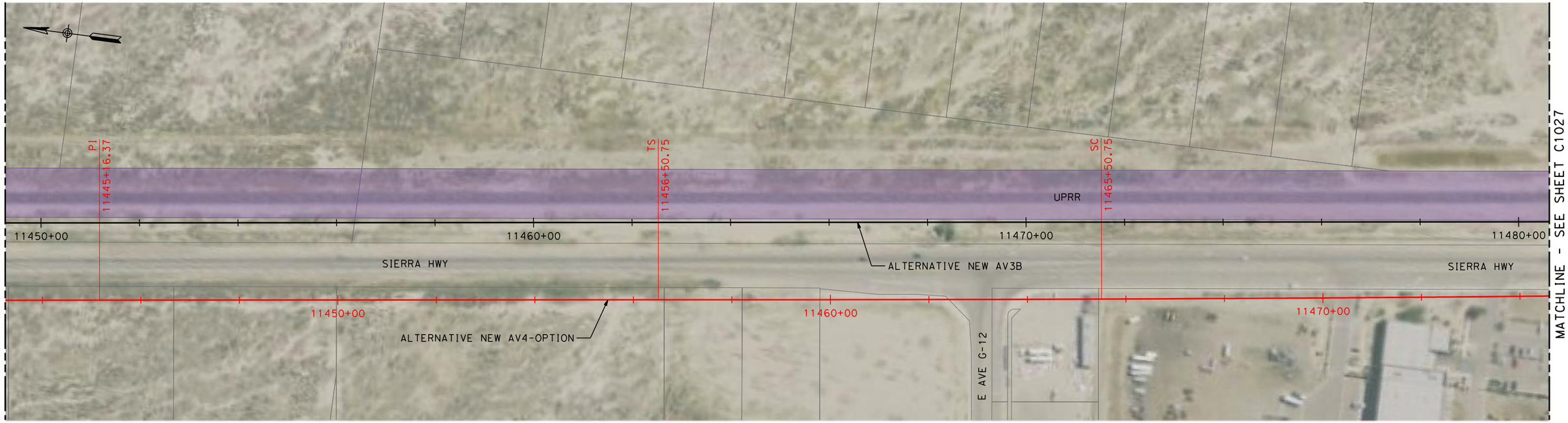
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11300+00 TO 11450+00
DRAFT

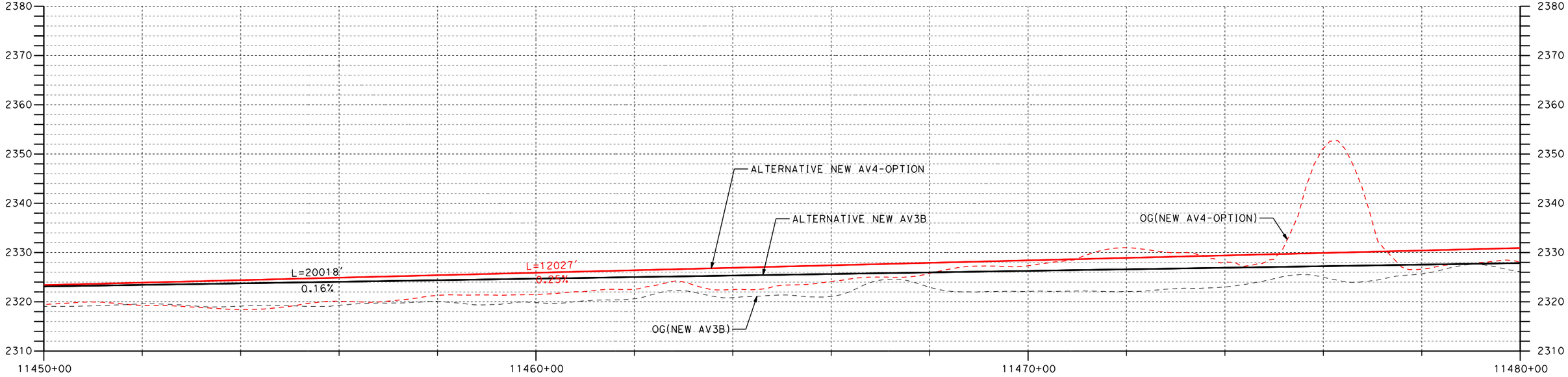
CONTRACT NO. HSR 06-0003
DRAWING NO. C1025
SCALE AS SHOWN
SHEET NO. 28 OF 51

7/26/2011 7:50:43 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1025.dgn
MOR53804



LEGEND:
- UPRR ROW
- METRO LINK ROW
- VIADUCT

PLAN



PROFILE

VER. 1"=10'
HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

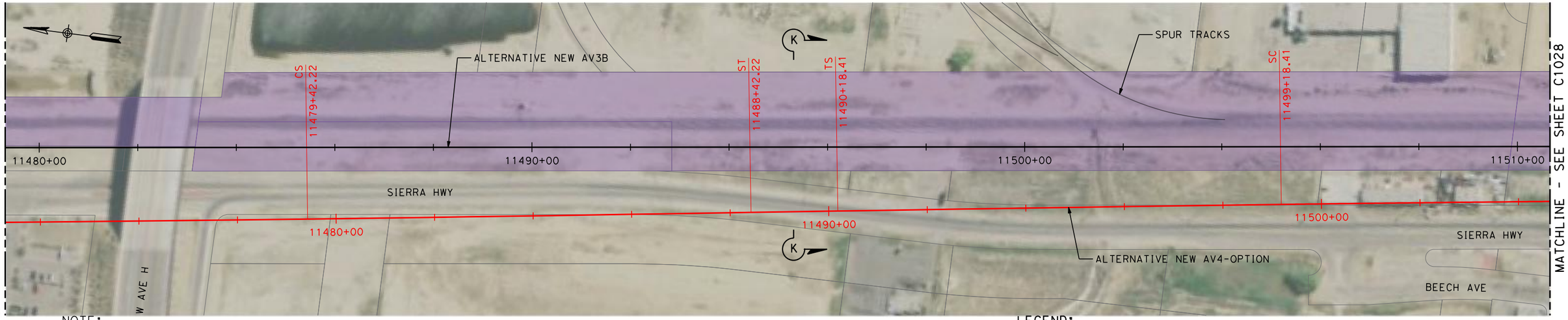
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11450+00 TO 11480+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1026
SCALE AS SHOWN
SHEET NO. 29 OF 51

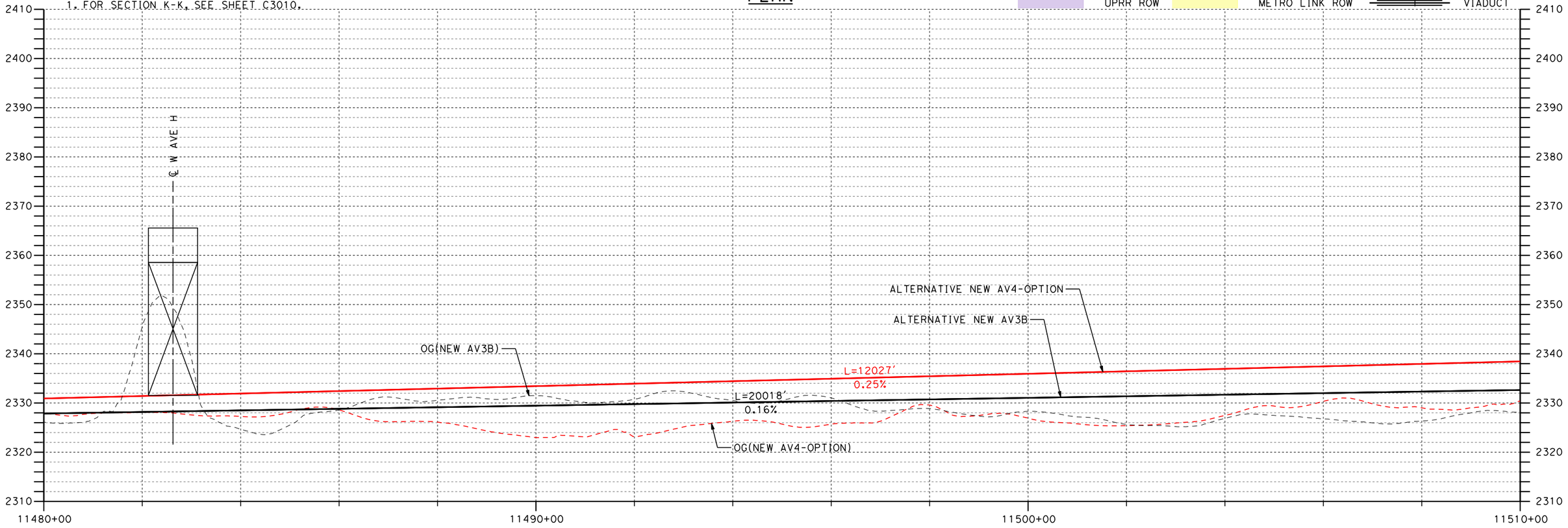
7/26/2011 7:51:16 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1026.dgn
MOR53804



NOTE:
1. FOR SECTION K-K, SEE SHEET C3010.

PLAN

LEGEND:
UPRR ROW
METRO LINK ROW
VIADUCT



PROFILE

10 0 10 20 VER. 1"=10'

100 0 100 200 HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

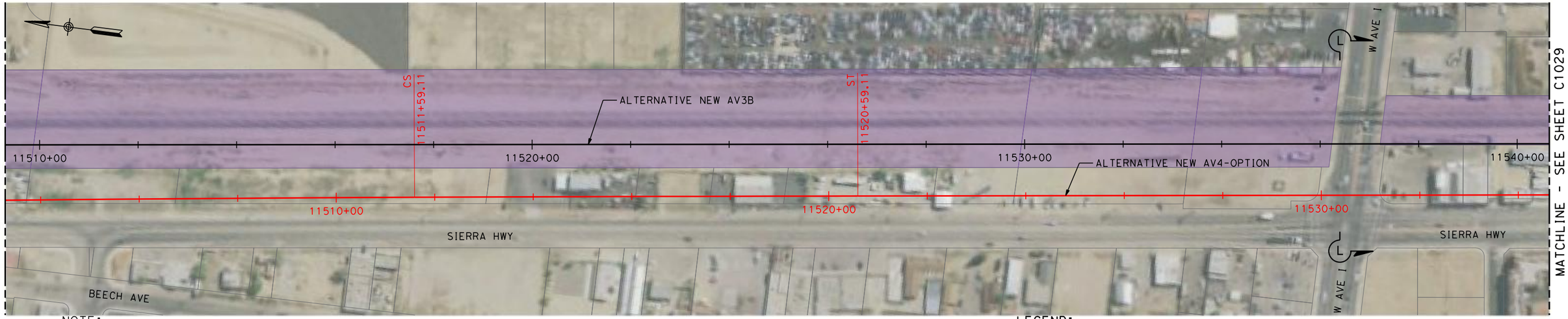
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11480+00 TO 11510+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1027
SCALE AS SHOWN
SHEET NO. 30 OF 51

7/26/2011 7:58:17 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1027.dgn
MOR53804

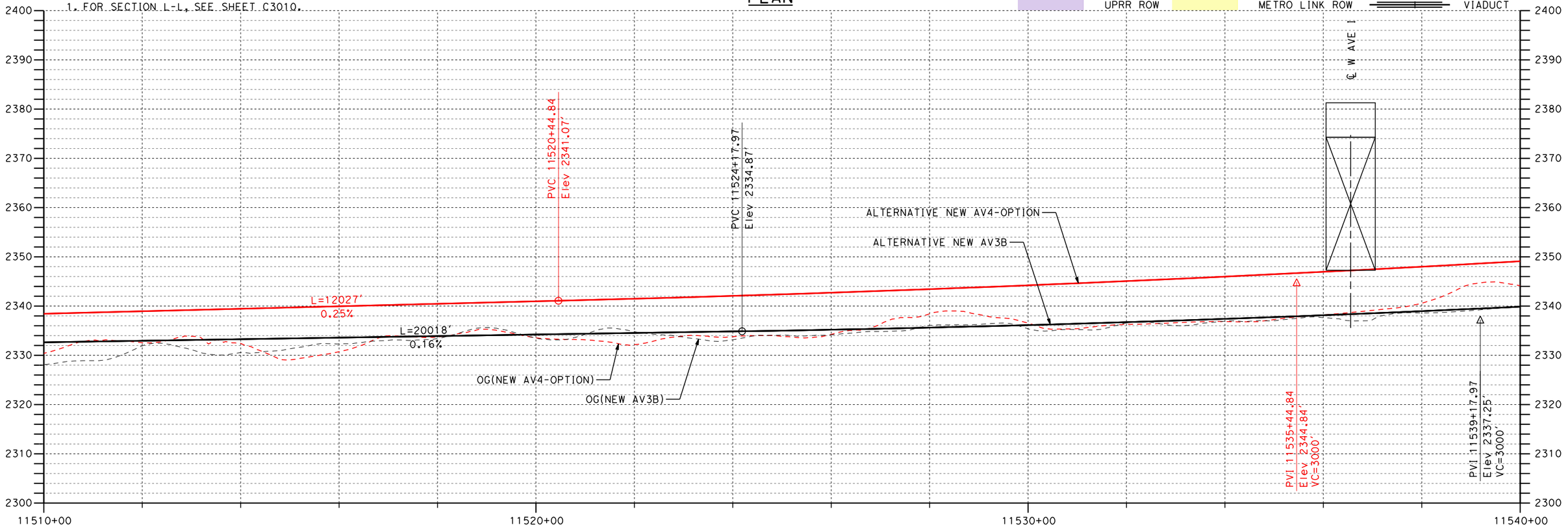


NOTE:

1. FOR SECTION L-L, SEE SHEET C3010.

PLAN

LEGEND: UPRR ROW | METRO LINK ROW | VIADUCT



PROFILE

VER. 1"=10' HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

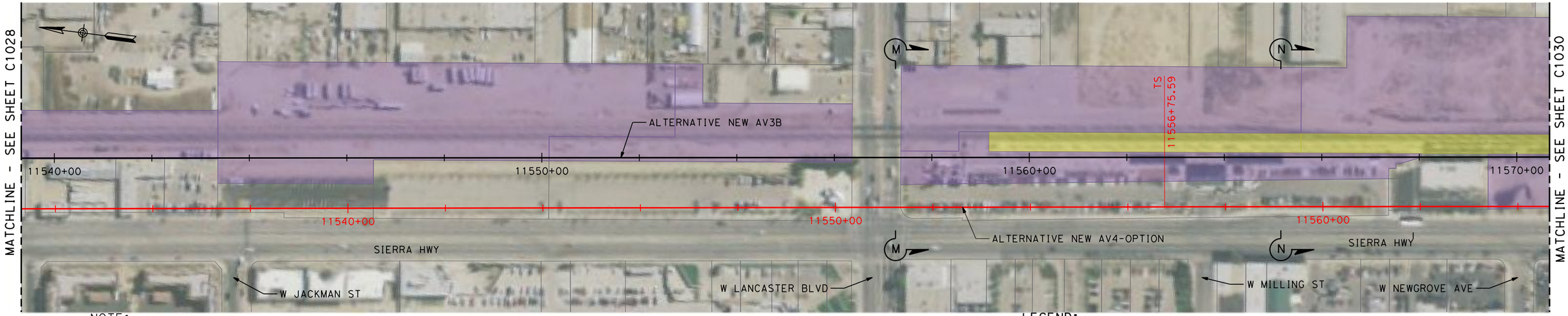
DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE Q. EARLE
DATE 07/26/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11510+00 TO 11540+00
DRAFT

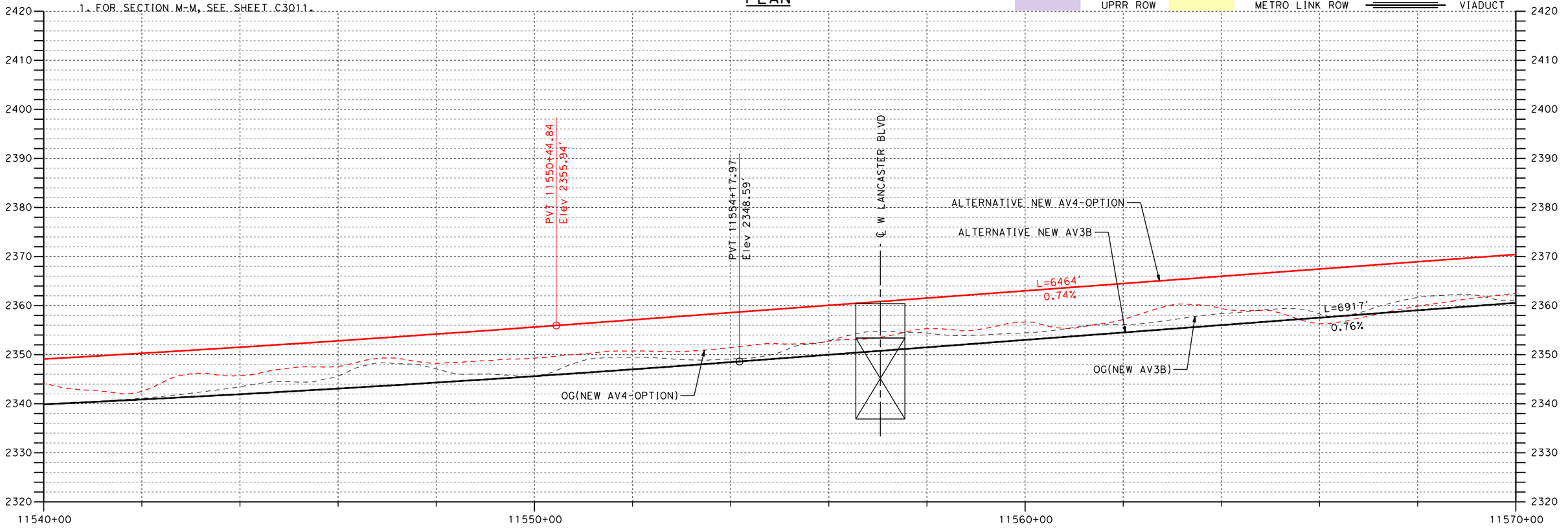
CONTRACT NO. HSR 06-0003
DRAWING NO. C1028
SCALE AS SHOWN
SHEET NO. 31 OF 51



PLAN

NOTE:
1. FOR SECTION M-M, SEE SHEET C3011.

LEGEND:
UPRR ROW
METRO LINK ROW
VIADUCT



PROFILE

VER. 1"=10'
HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

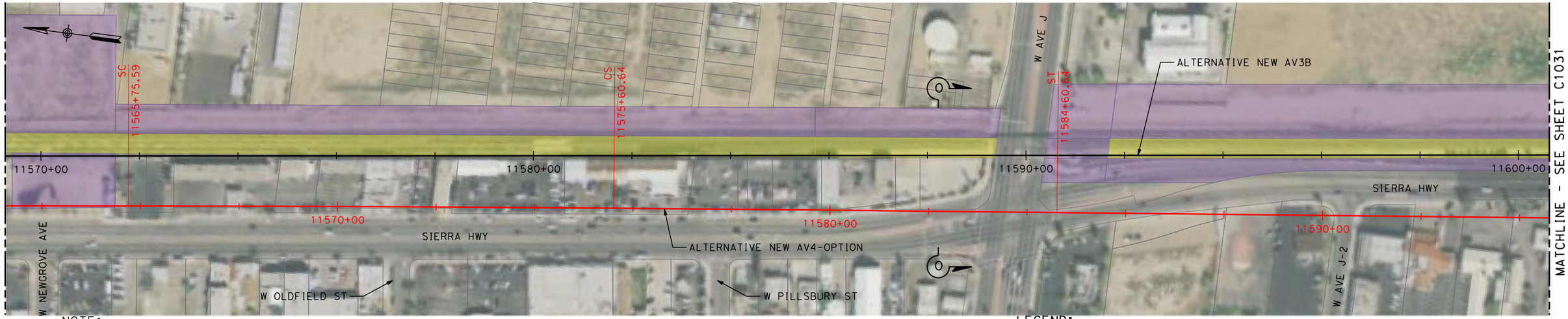
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11540+00 TO 11570+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1029
SCALE AS SHOWN
SHEET NO. 32 OF 51

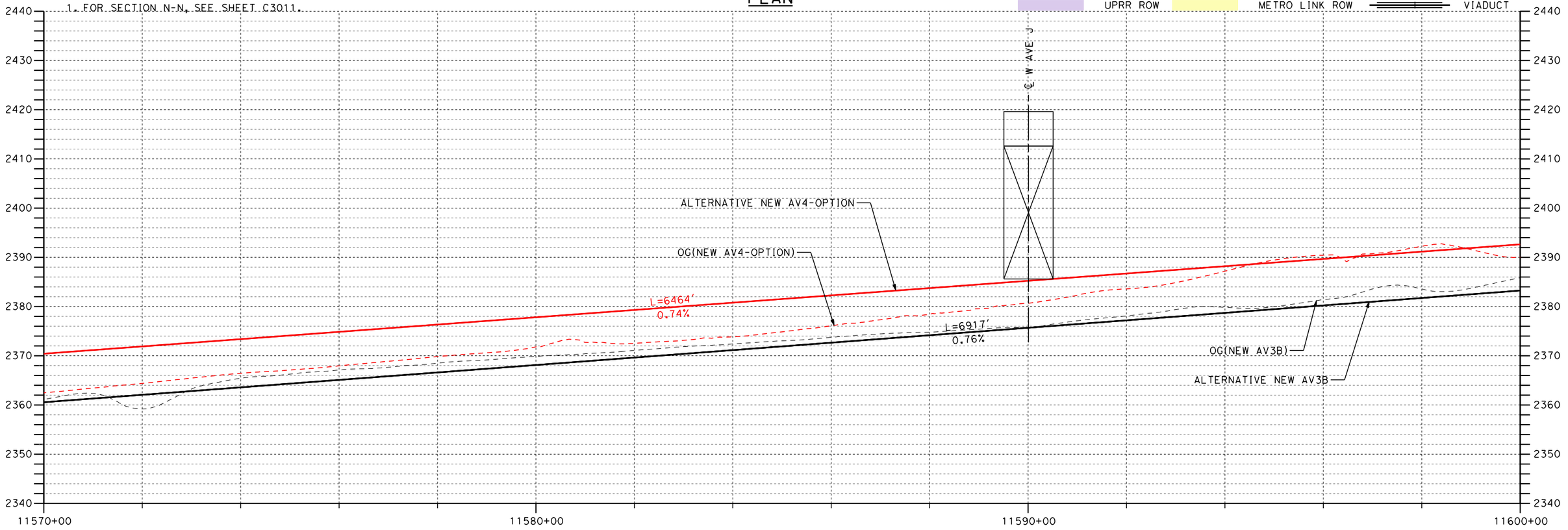
7/28/2011 5:56:58 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\VA-Bakersfield to Palmdale\BP-C-1029.dgn
MOR53804



NOTE:
1. FOR SECTION N-N, SEE SHEET C3011.

PLAN

LEGEND:
UPRR ROW
METRO LINK ROW
VIADUCT



PROFILE

VER. 1"=10'
HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

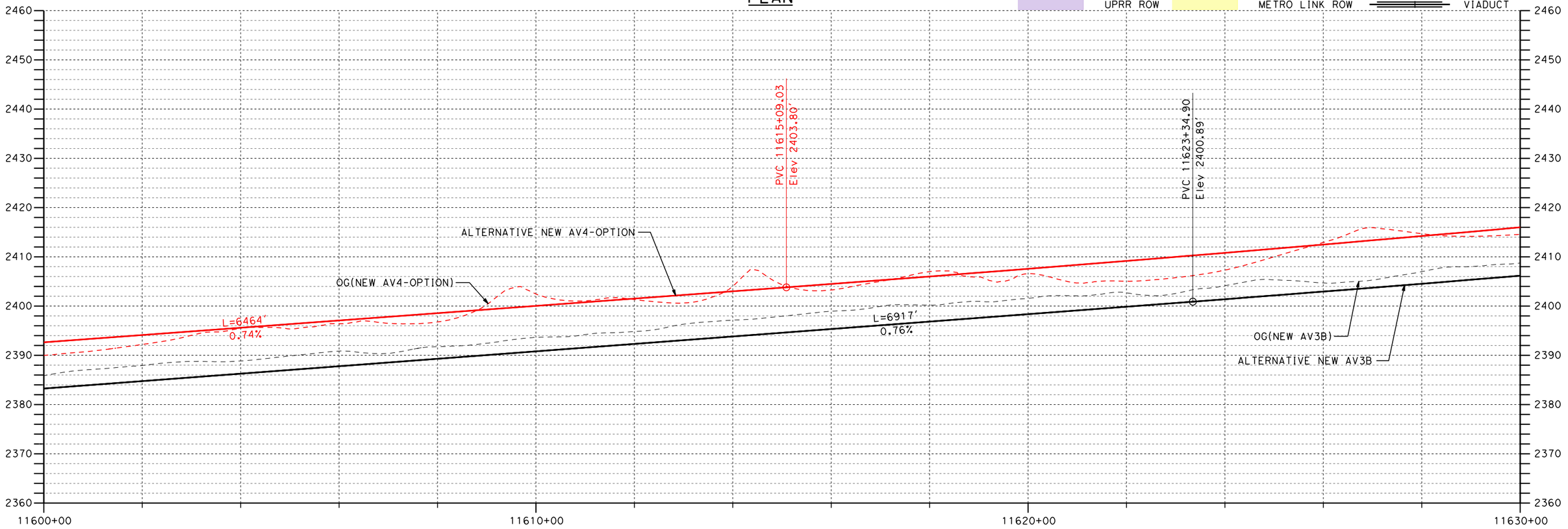
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11570+00 TO 11600+00
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1030
SCALE AS SHOWN
SHEET NO. 33 OF 51

7/28/2011 6:00:06 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1030.dgn
MOR53804

PLAN

LEGEND: UPRR ROW | METRO LINK ROW | VIADUCT



PROFILE

VER. 1"=10' (10 0 10 20)

HOR. 1"=100' (100 0 100 200)

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

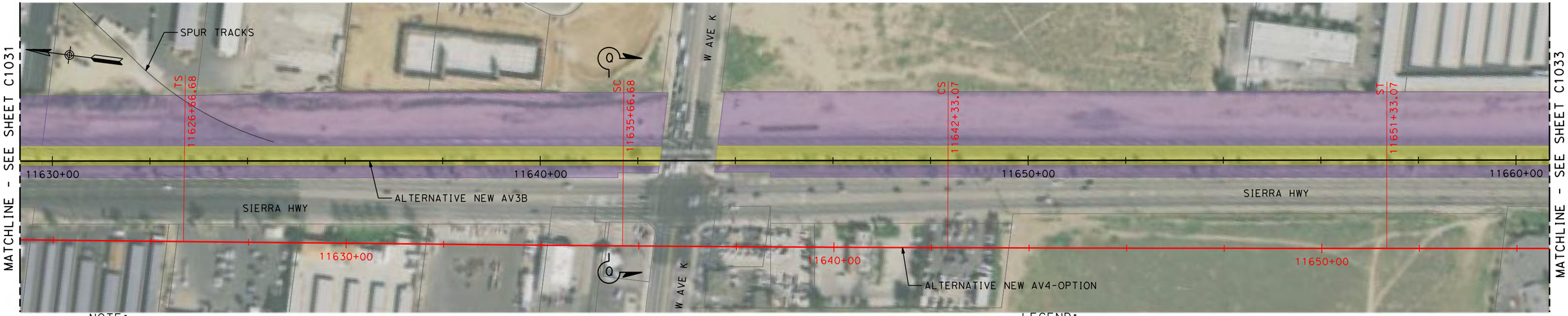
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11600+00 TO 11630+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1031
SCALE AS SHOWN
SHEET NO. 34 OF 51

7/28/2011 6:01:35 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1031.dgn

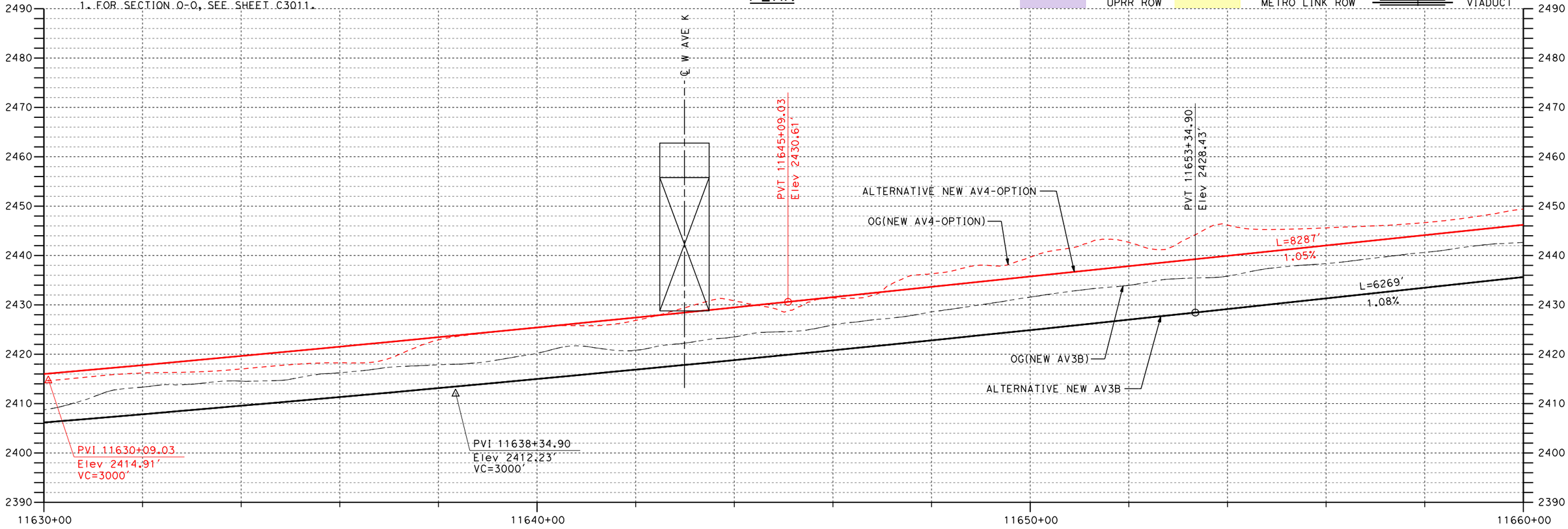
MOR53804



NOTE:
1. FOR SECTION O-O, SEE SHEET C3011.

PLAN

LEGEND:
UPRR ROW
METRO LINK ROW
VIADUCT



PROFILE

10 0 10 20
VER. 1"=10'

100 0 100 200
HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE Q. EARLE
DATE 07/26/11

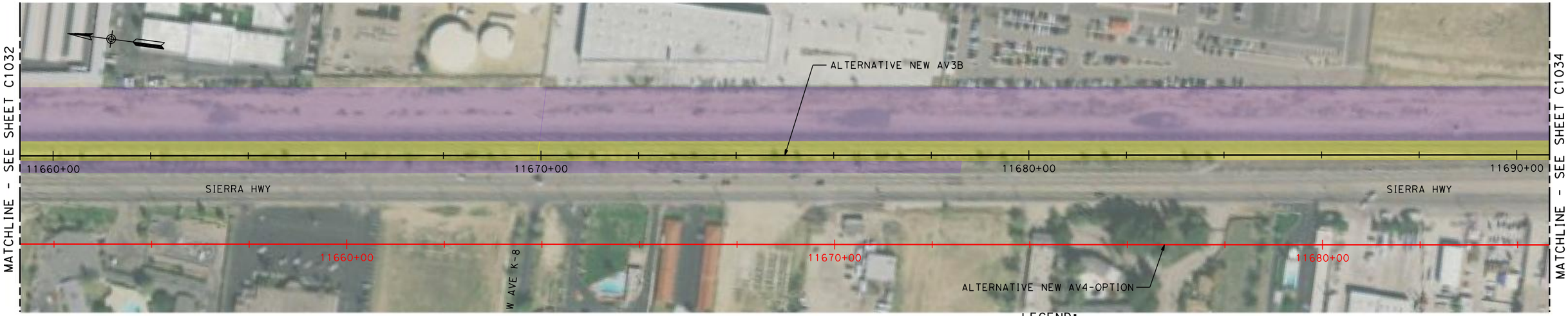
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11630+00 TO 11660+00
DRAFT

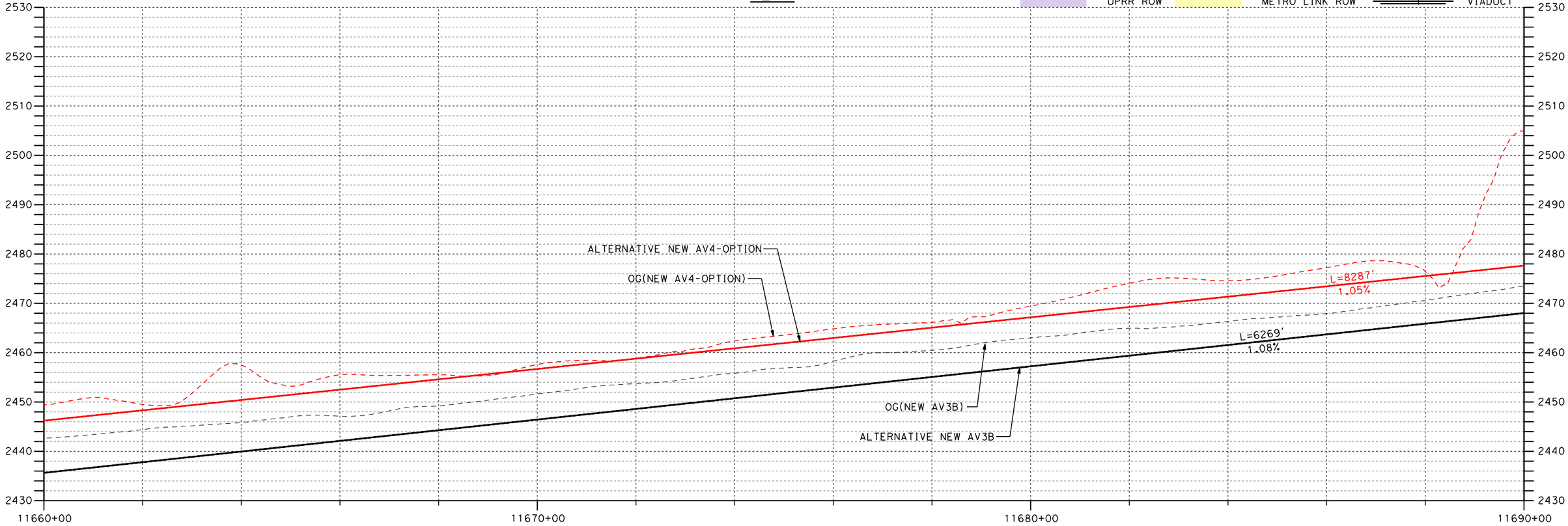
CONTRACT NO. HSR 06-0003
DRAWING NO. C1032
SCALE AS SHOWN
SHEET NO. 35 OF 51

7/28/2011 6:02:34 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1032.dgn
MOR53804



PLAN

LEGEND: UPRR ROW | METRO LINK ROW | VIADUCT



PROFILE

VER. 1"=10' 10 0 10 20

HOR. 1"=100' 100 0 100 200

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE Q. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11660+00 TO 11690+00

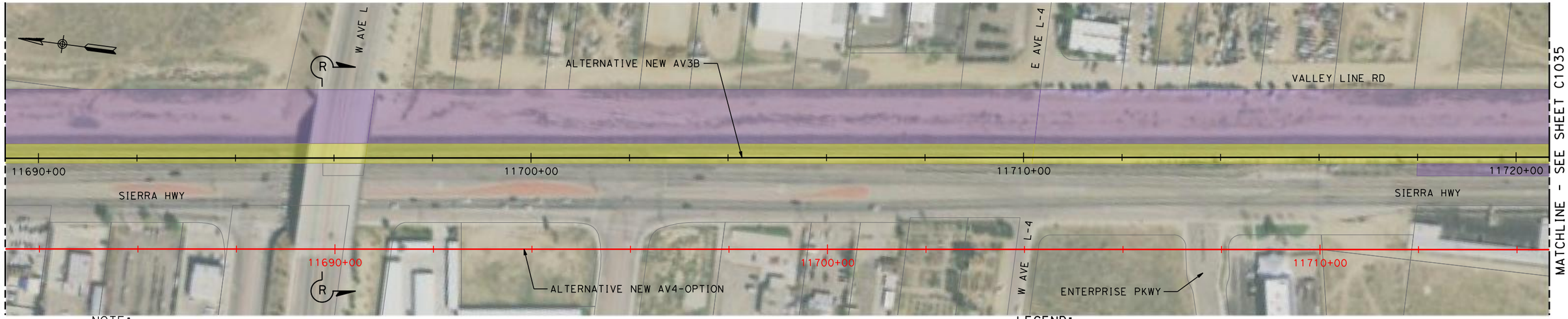
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1033
SCALE AS SHOWN
SHEET NO. 36 OF 51

7/26/2011 8:02:06 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1033.dgn
MOR53804

MATCHLINE - SEE SHEET C1033

MATCHLINE - SEE SHEET C1035



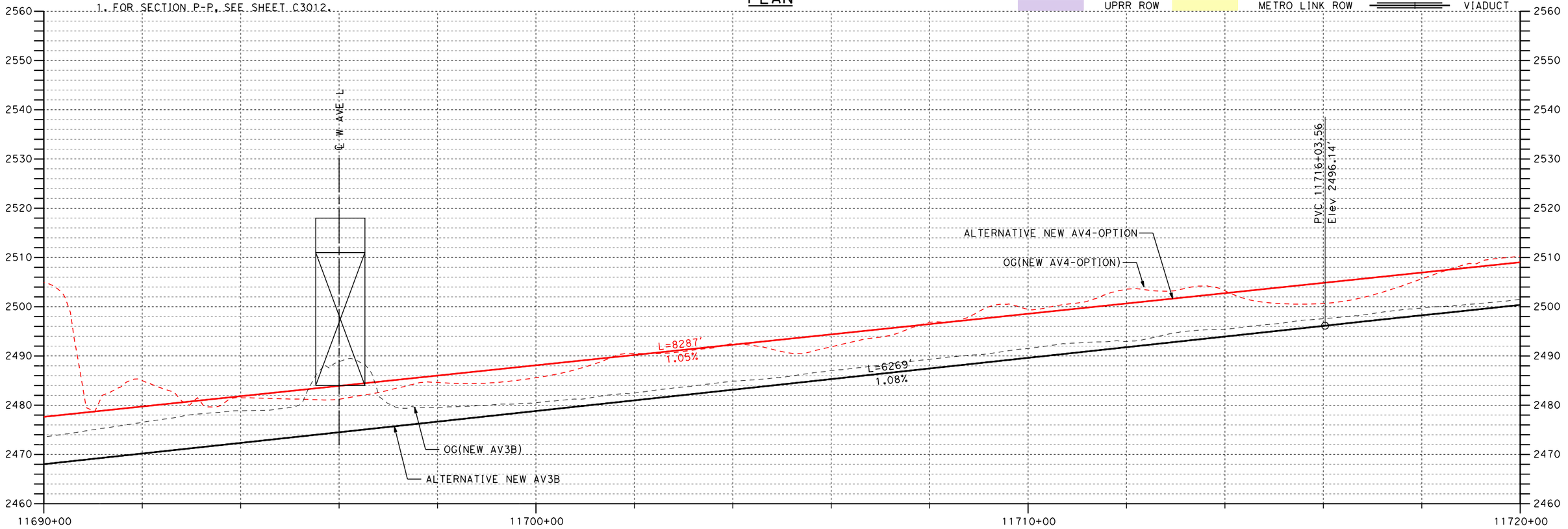
NOTE:

1. FOR SECTION P-P, SEE SHEET C3012.

PLAN

LEGEND:

UPRR ROW | METRO LINK ROW | VIADUCT



PROFILE

VER. 1"=10'

HOR. 1"=100'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE Q. EARLE
DATE 05/20/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

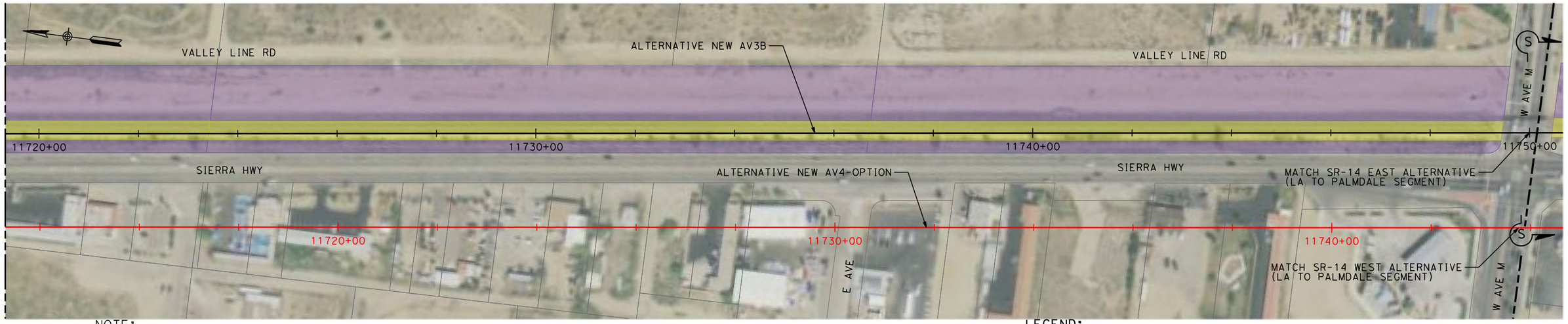
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11690+00 TO 11720+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C1034
SCALE AS SHOWN
SHEET NO. 37 OF 51

7/28/2011 6:04:11 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-1034.dgn

MOR53804

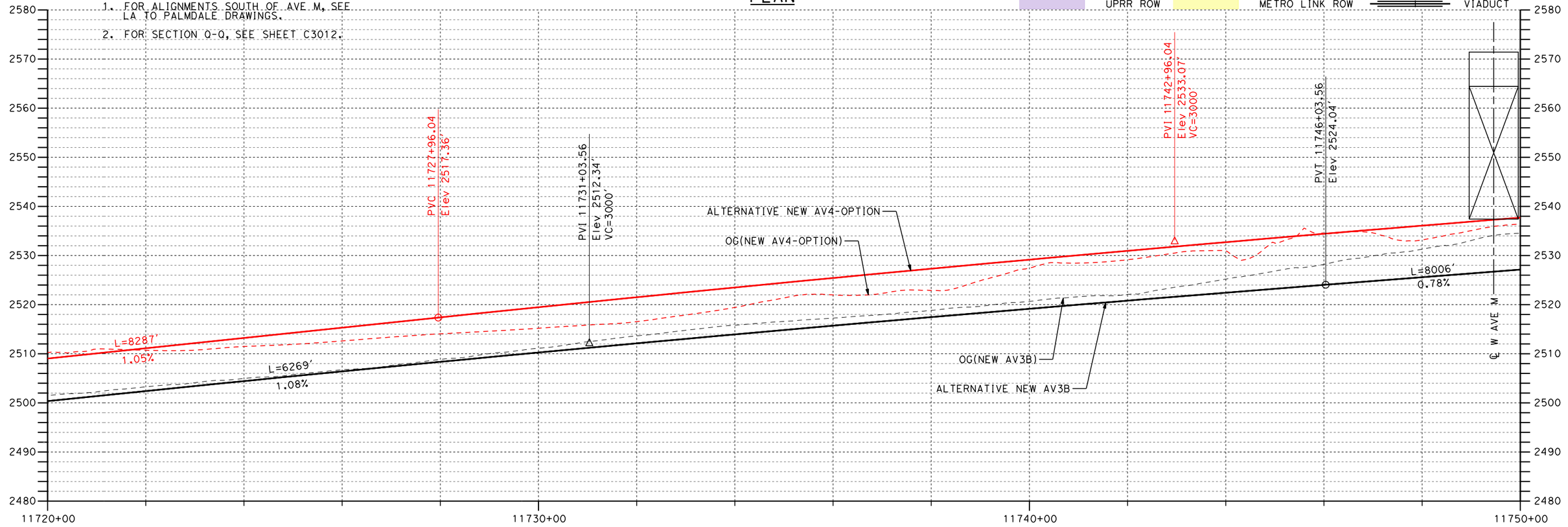


NOTE:

1. FOR ALIGNMENTS SOUTH OF AVE M, SEE LA TO PALMDALE DRAWINGS.
2. FOR SECTION Q-Q, SEE SHEET C3012.

PLAN

LEGEND: UPRR ROW | METRO LINK ROW | VIADUCT



PROFILE

VER. 1"=10' (10 0 10 20) HOR. 1"=100' (100 0 100 200)

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

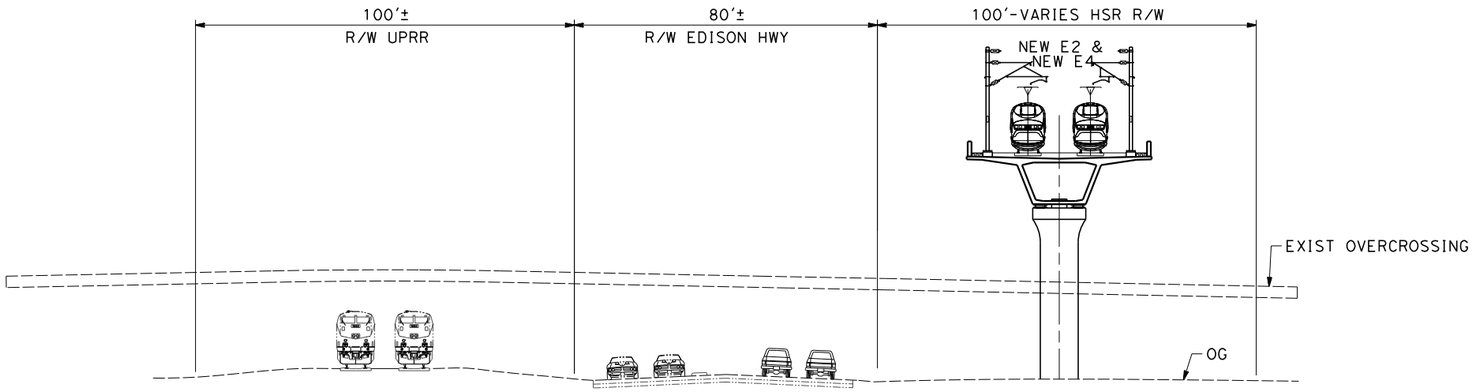
URS | HMM | ARUP — CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

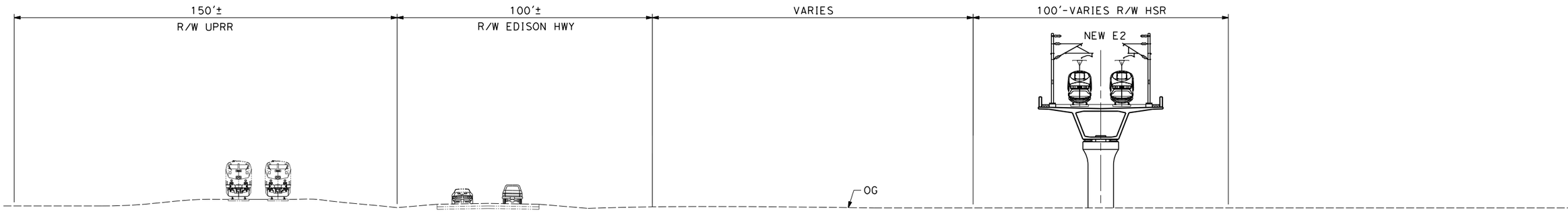
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
ANTELOPE VALLEY
STA 11720+00 TO 11750+00

DRAFT

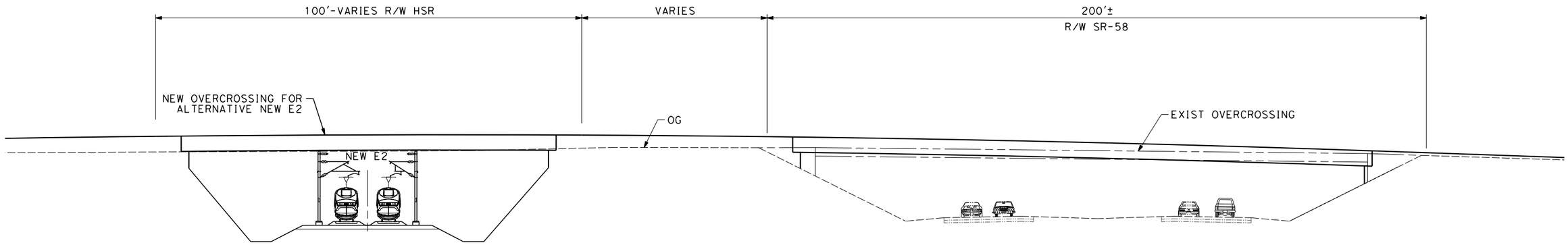
CONTRACT NO. C-0-0000
DRAWING NO. C1035
SCALE AS SHOWN
SHEET NO. 38 OF 51



SECTION A-A



SECTION B-B



SECTION C-C

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R.DEASON
DRAWN BY R.DEASON
CHECKED BY J.BINNING
IN CHARGE O.EARLE
DATE 07/26/11

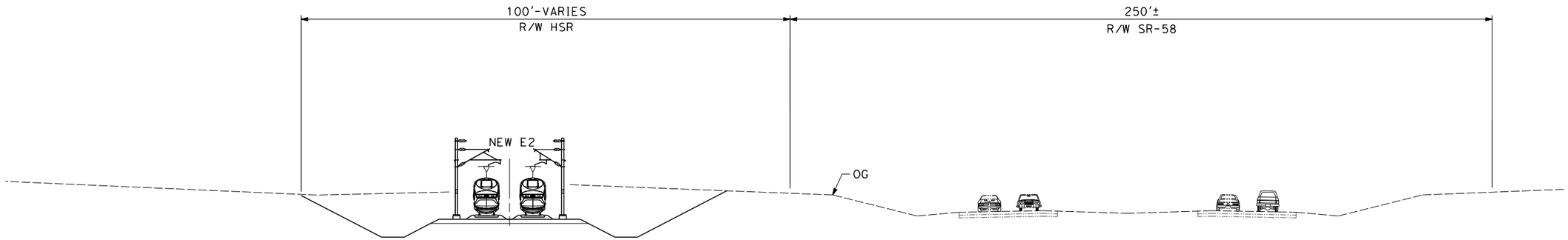
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

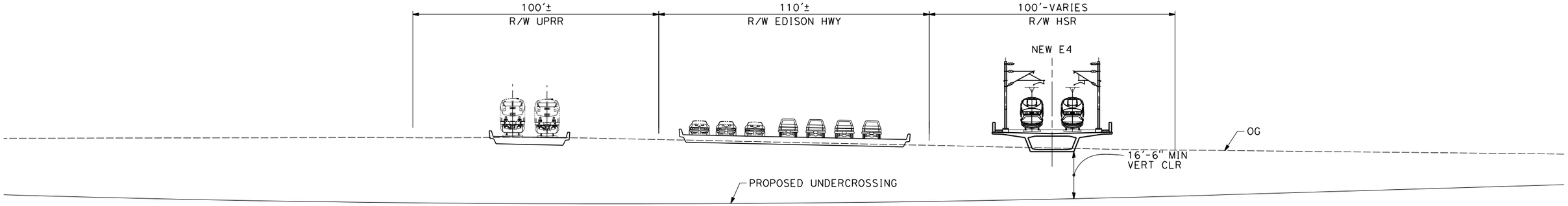
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW E2 & NEW E4
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3000
SCALE AS SHOWN
SHEET NO. 39 OF 51

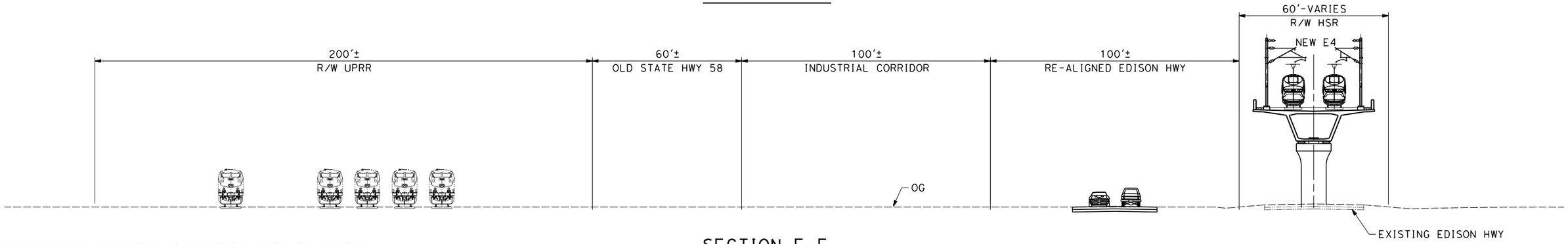
BIN52529 7/26/2011 12:22:07 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3000.dgn



SECTION D-D



SECTION E-E



SECTION F-F

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R.DEASON
DRAWN BY R.DEASON
CHECKED BY J.BINNING
IN CHARGE Q.EARLE
DATE 07/26/11

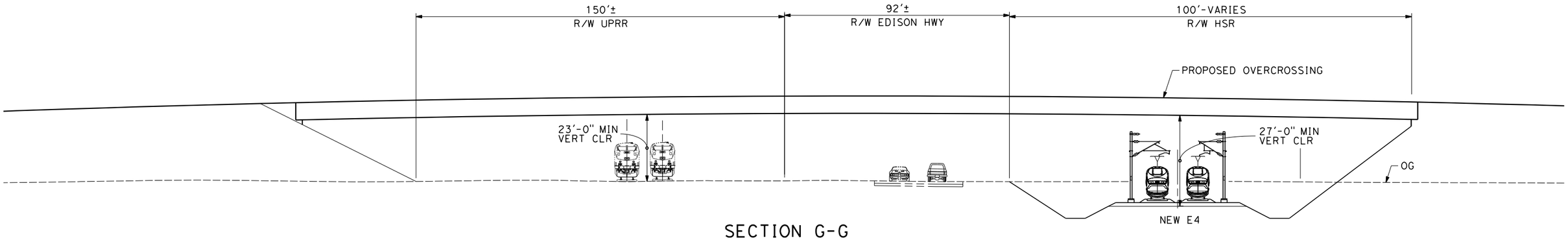
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW E2 & NEW E4
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3001
SCALE AS SHOWN
SHEET NO. 40 OF 51

BIN52529



SECTION G-G

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY R.DEASON
DRAWN BY R.DEASON
CHECKED BY J.BINNING
IN CHARGE Q.EARLE
DATE 07/26/11

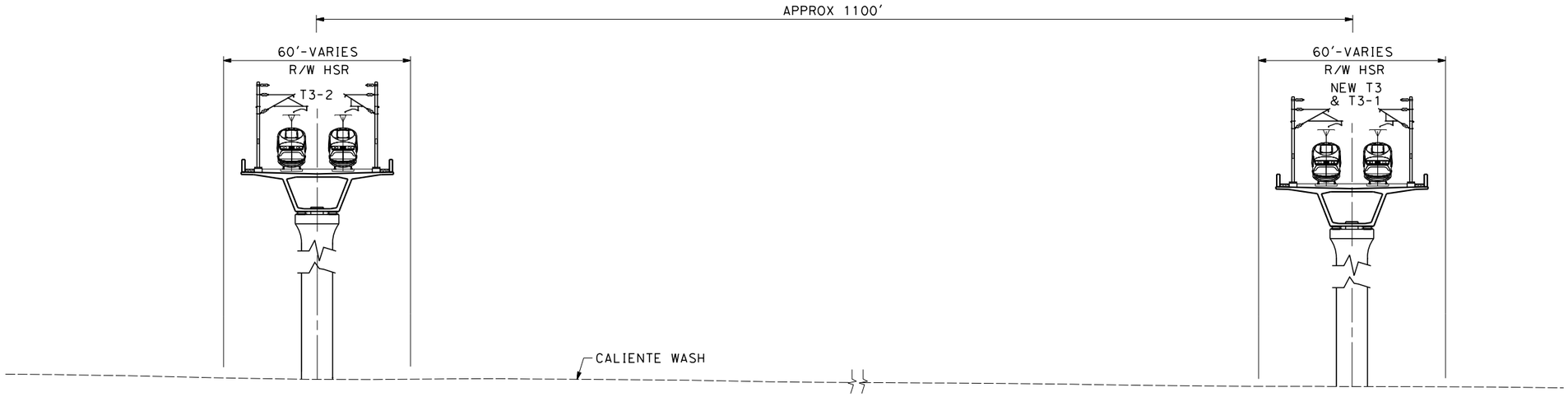
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

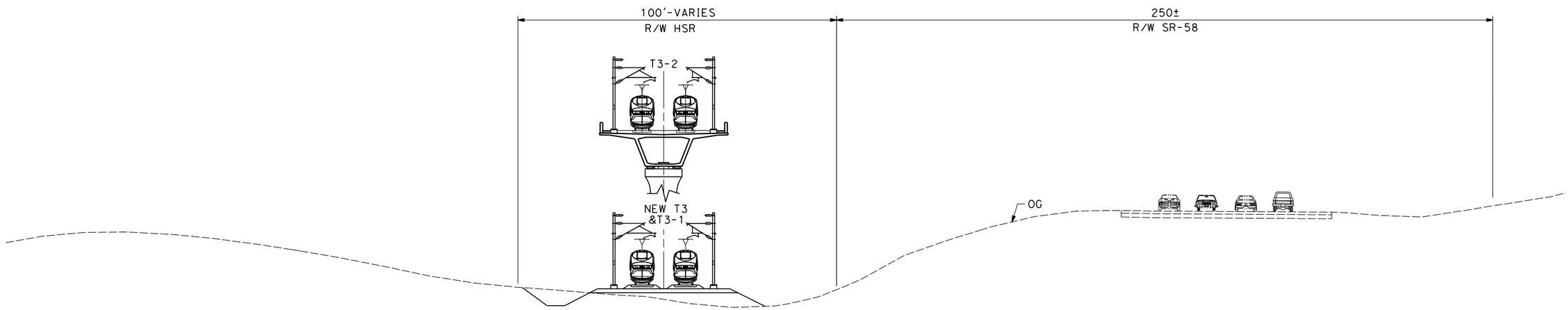
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVE NEW E4
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3002
SCALE AS SHOWN
SHEET NO. 41 OF 51

BIN52529 7/26/2011 12:26:44 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3002.dgn



SECTION A-A



SECTION B-B

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE O. EARLE
DATE 07/26/11

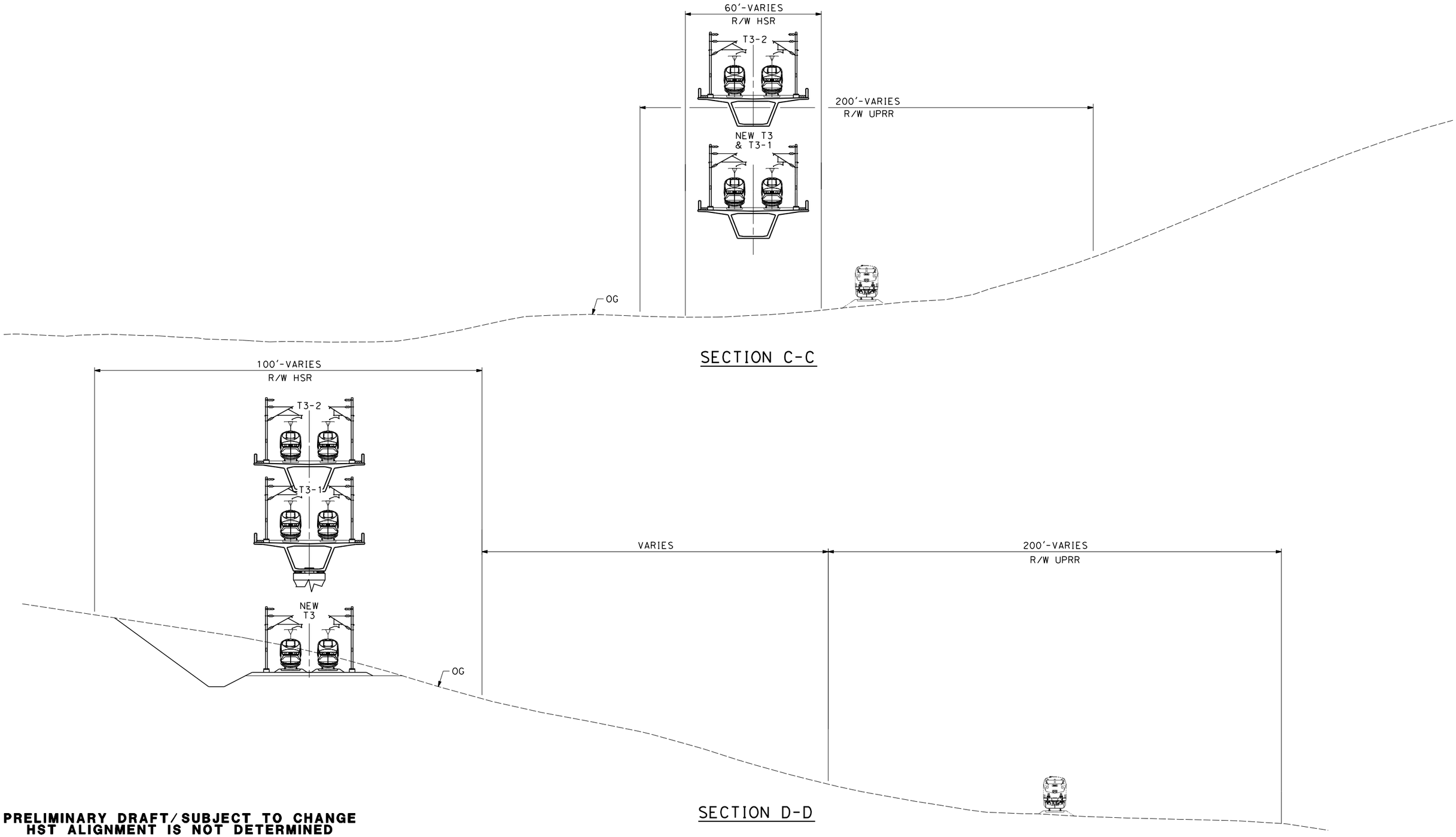
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3003
SCALE NOT TO SCALE
SHEET NO. 42 OF 51

7/26/2011 12:46:10 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3003.dgn
BIN52529



SECTION C-C

SECTION D-D

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY: J. NETTLETON
DRAWN BY: T. PRETZER
CHECKED BY: J. BINNING
IN CHARGE: O. EARLE
DATE: 07/26/11

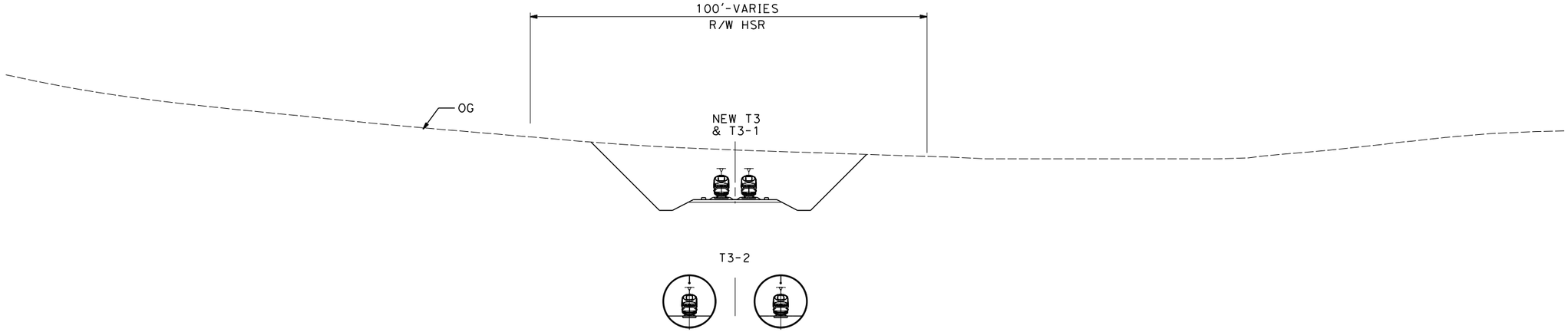
URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

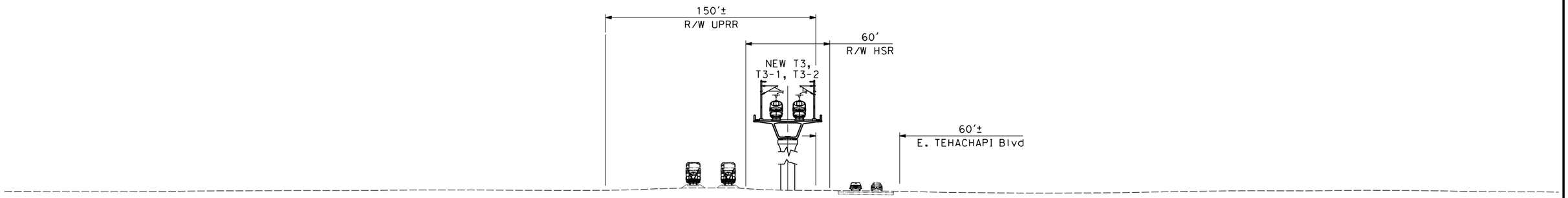
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3004
SCALE NOT TO SCALE
SHEET NO. 43 OF 51

BIN52529 7/26/2011 12:47:14 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3004.dgn



SECTION E-E



SECTION F-F

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE Q. EARLE
DATE 07/26/11

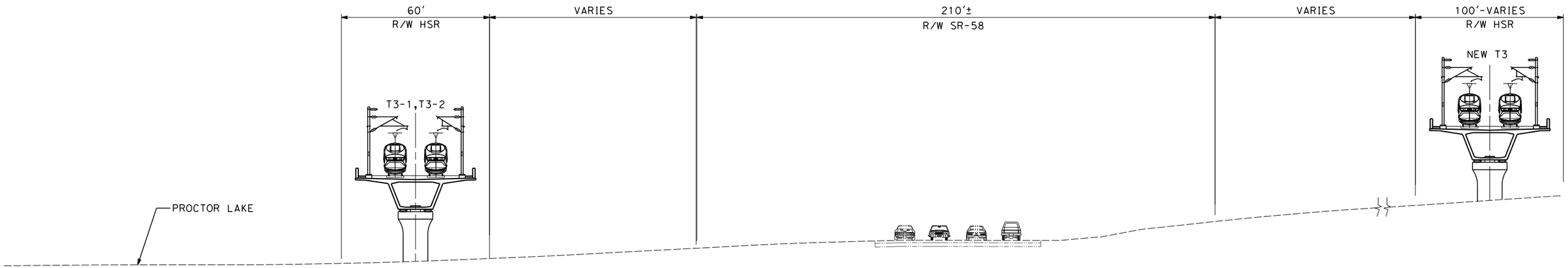
URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

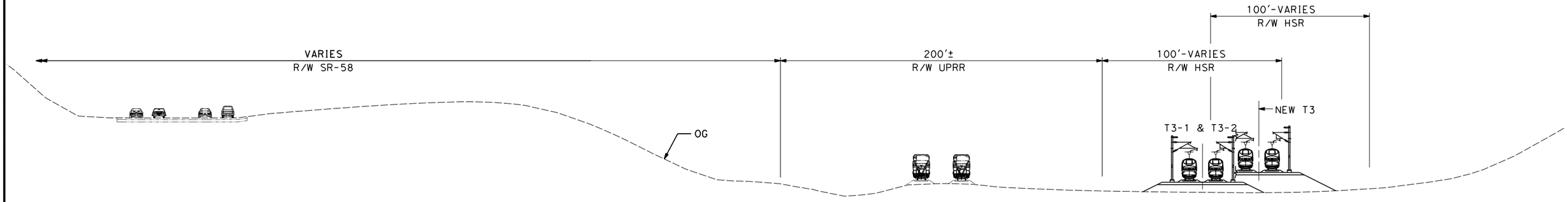
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW T3, T3-1 & T3-2
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3005
SCALE NOT TO SCALE
SHEET NO. 44 OF 51

BIN52529 7/26/2011 12:48:26 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3005.dgn



SECTION G-G



SECTION H-H

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. NETTLETON
DRAWN BY T. PRETZER
CHECKED BY J. BINNING
IN CHARGE Q. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

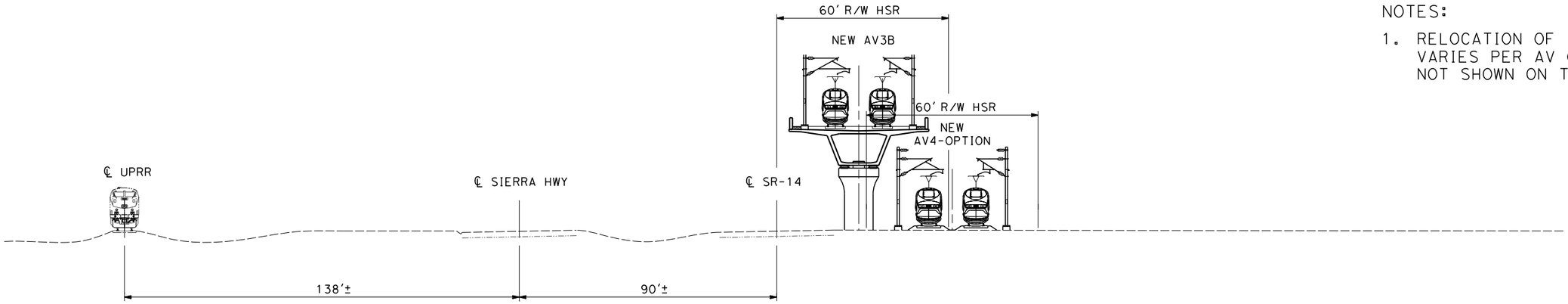
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES T3-1 & T3-2
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3006
SCALE NOT TO SCALE
SHEET NO. 45 OF 51

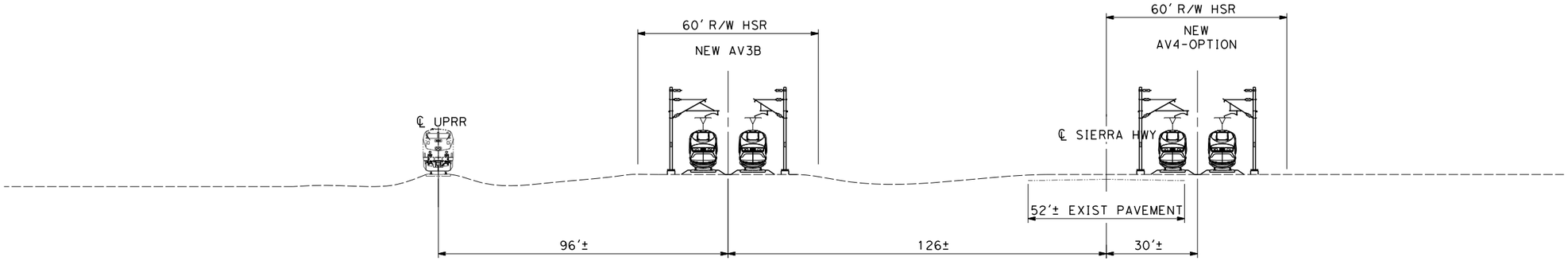
BIN52529 7/26/2011 11:58:02 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3006.dgn

NOTES:

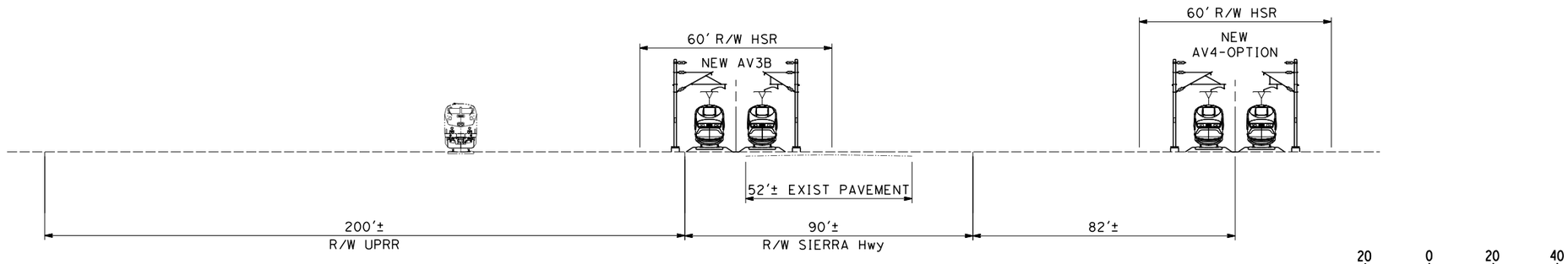
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.



SECTION A-A



SECTION B-B



SECTION C-C

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V.O./D.B.
CHECKED BY C. RAMIREZ
IN CHARGE O.EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

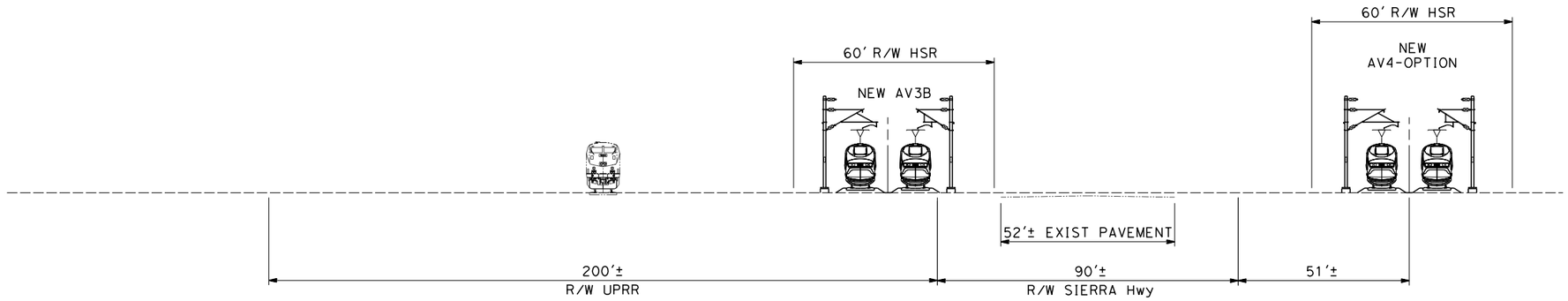
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3007
SCALE AS SHOWN
SHEET NO. 46 OF 51

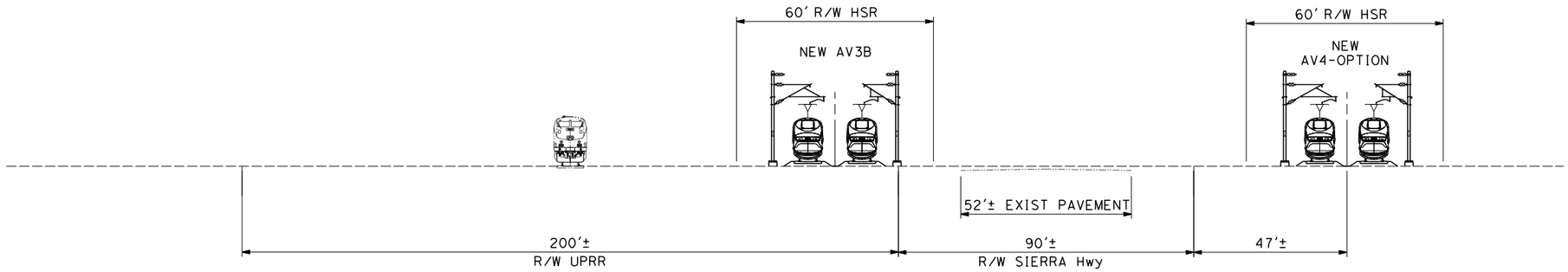
MOR53804 7/26/2011 9:01:33 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3007.dgn

NOTES:

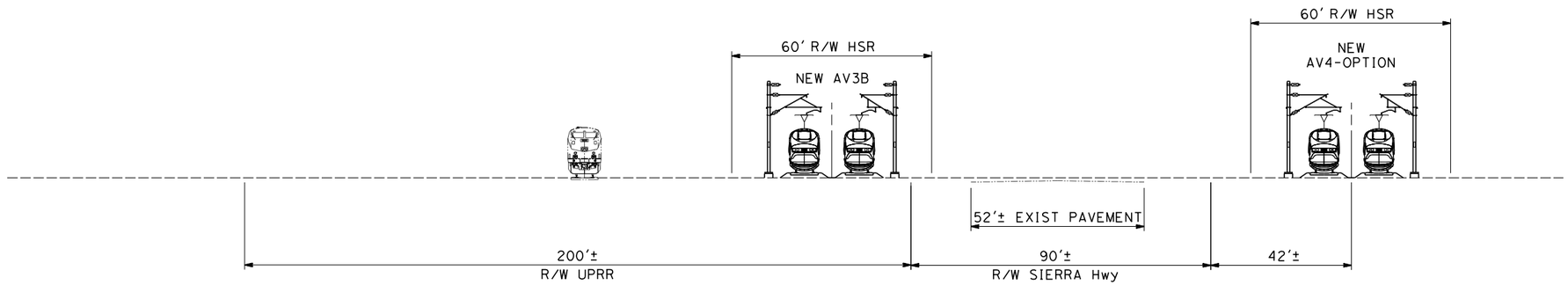
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.



SECTION D-D



SECTION E-E



SECTION F-F

20 0 20 40
1"=20'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V.O./D.B.
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

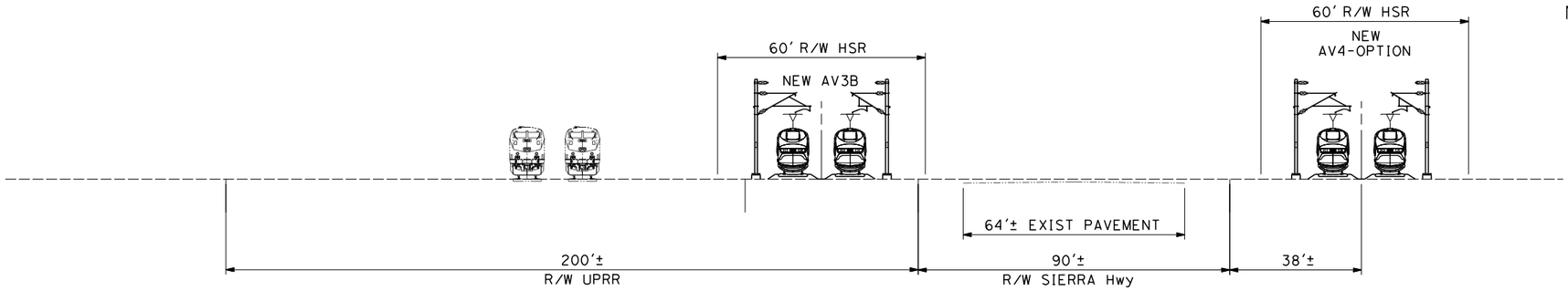
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3008
SCALE AS SHOWN
SHEET NO. 47 OF 51

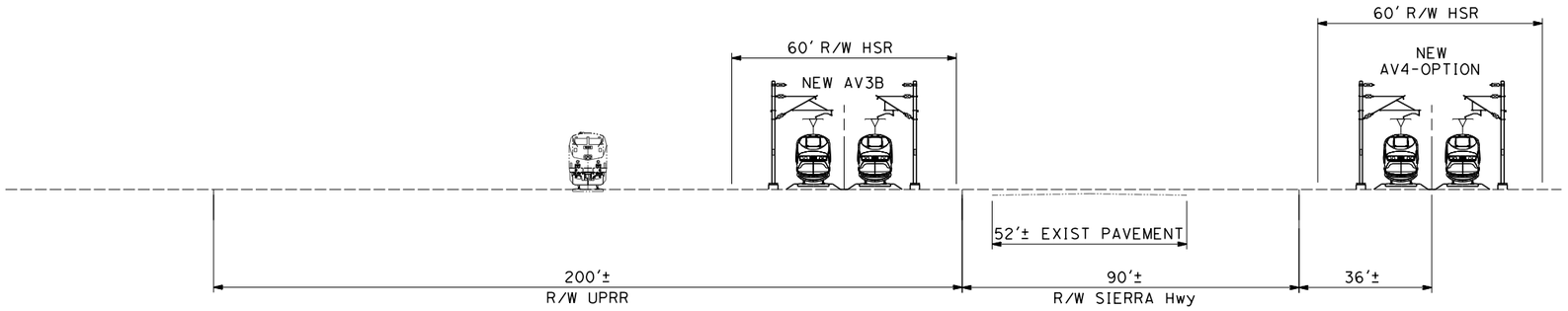
MOR53804 7/26/2011 9:00:41 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3008.dgn

NOTES:

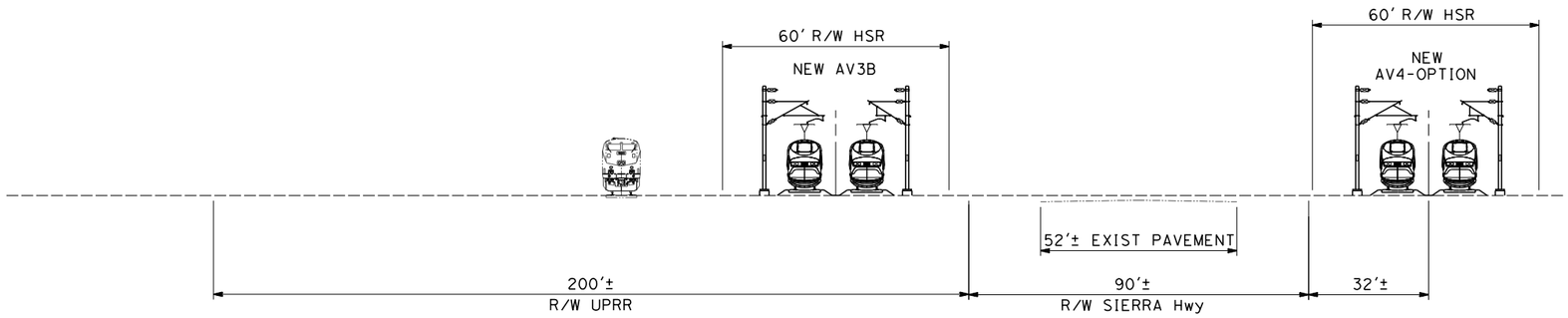
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.



SECTION G-G



SECTION H-H



SECTION I-I

20 0 20 40
1"=20'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE Q. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

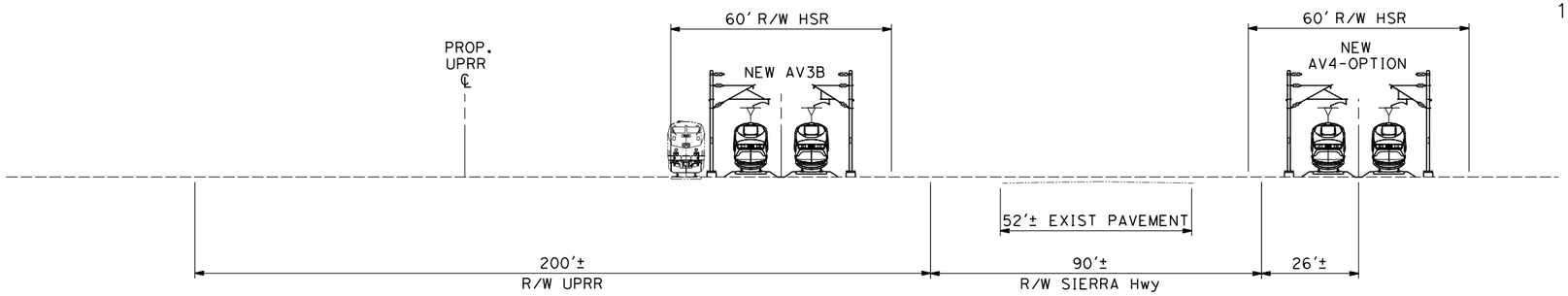
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-003
DRAWING NO. C3009
SCALE AS SHOWN
SHEET NO. 48 OF 51

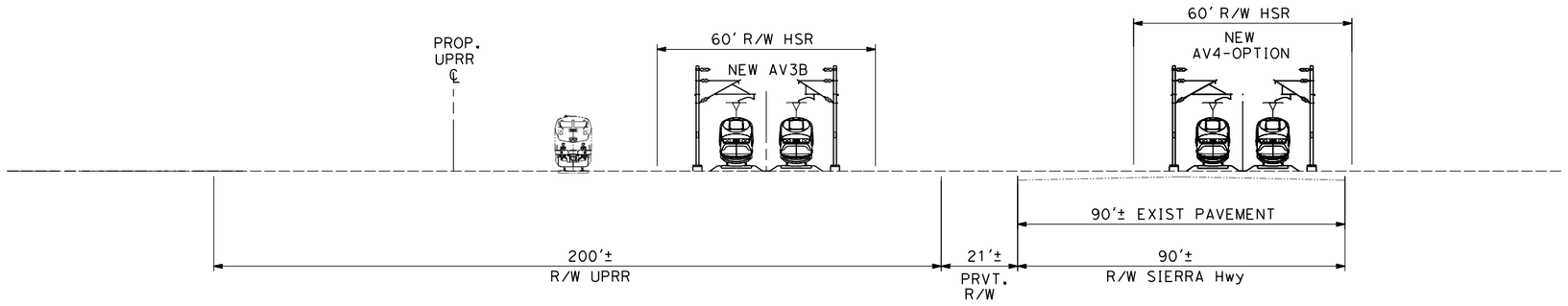
7/26/2011 8:59:55 AM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3009.dgn
MOR53804

NOTES:

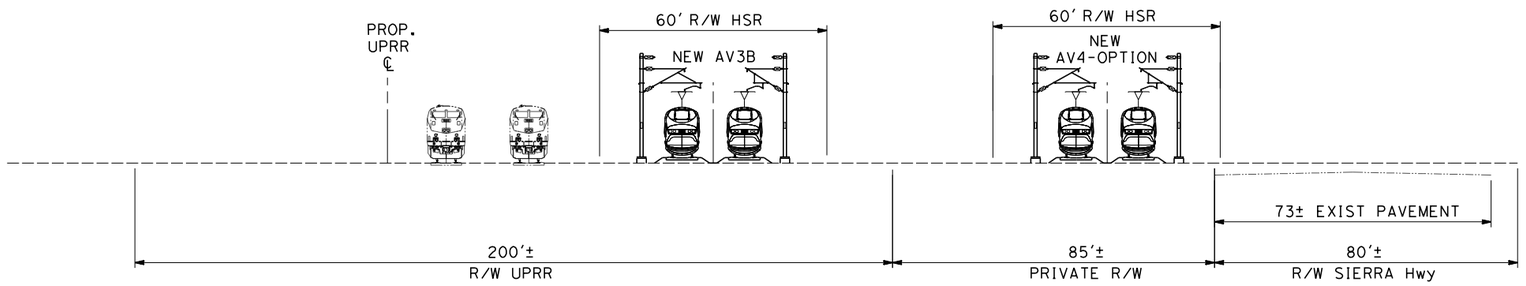
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.



SECTION J-J



SECTION K-K



SECTION L-L

20 0 20 40
1"=20'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V.O./D.B.
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

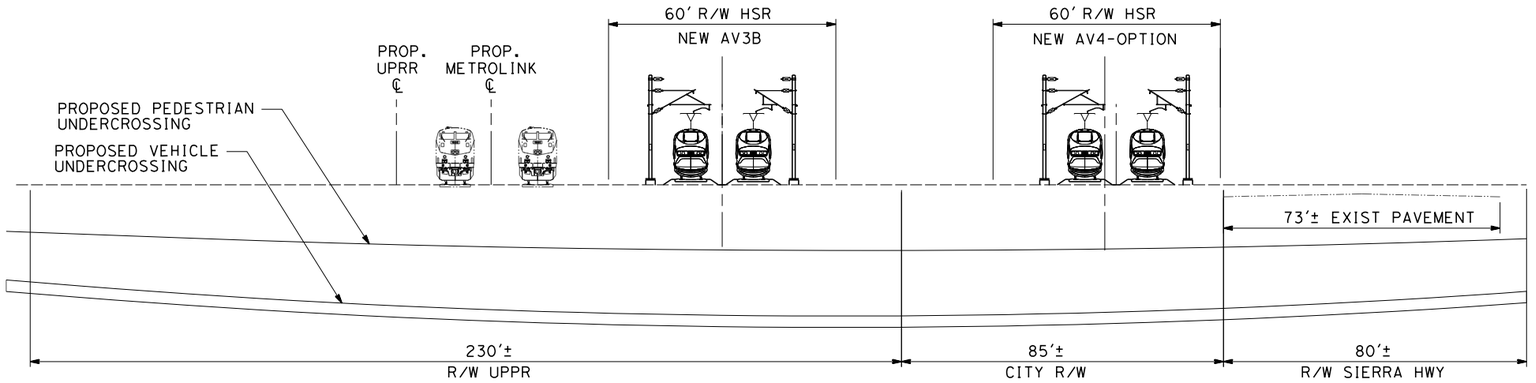
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

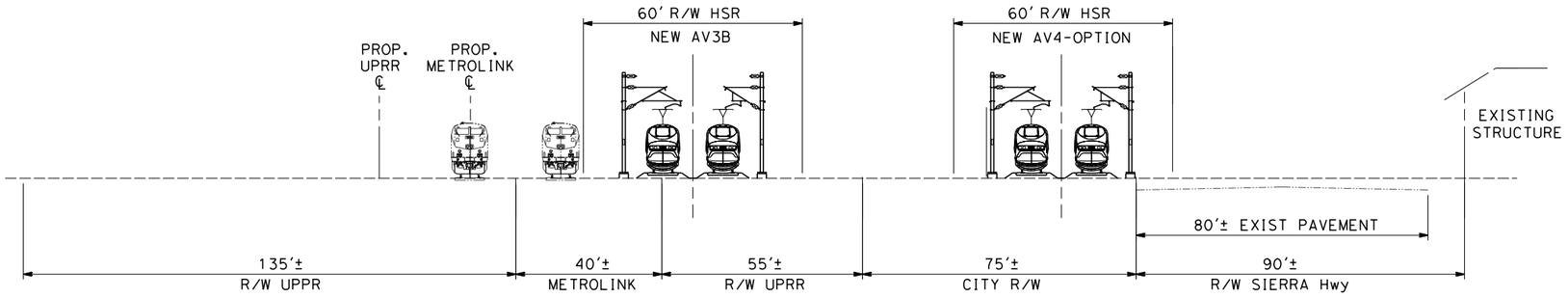
CONTRACT NO. HSR 06-0003
DRAWING NO. C3010
SCALE AS SHOWN
SHEET NO. 49 OF 51

NOTES:

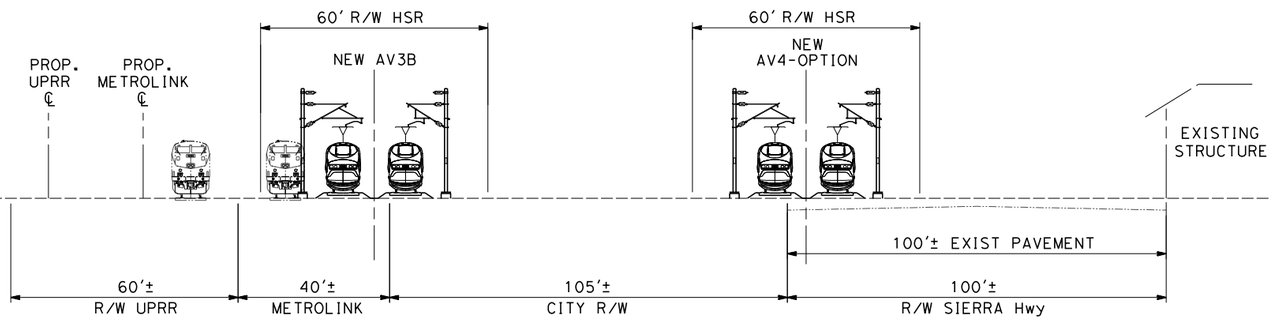
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.



SECTION M-M



SECTION N-N



SECTION O-O

20 0 20 40
1"=20'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V.O./D.B.
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

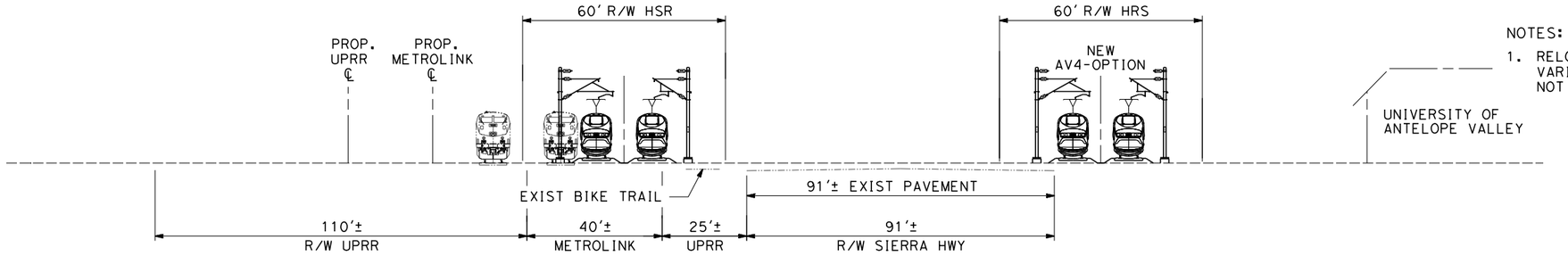
URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3011
SCALE AS SHOWN
SHEET NO. 50 OF 51

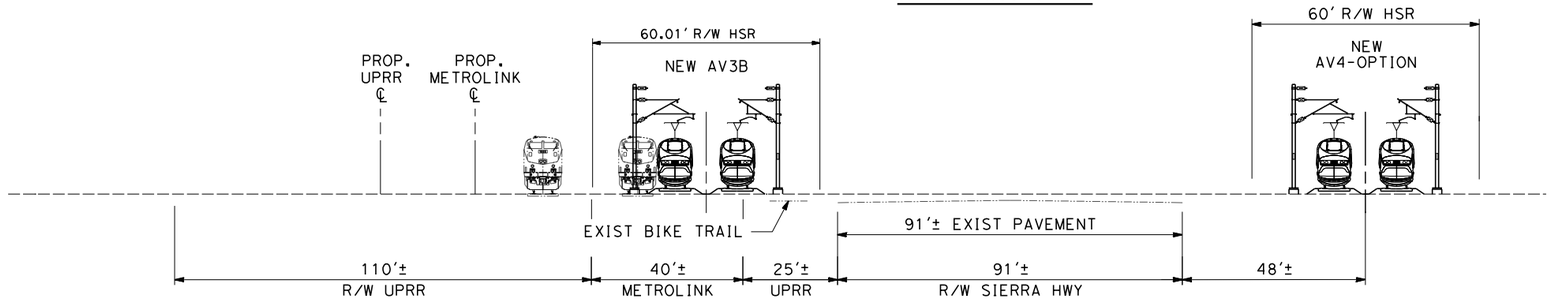
MOR53804 7/28/2011 5:53:49 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3011.dgn



NOTES:

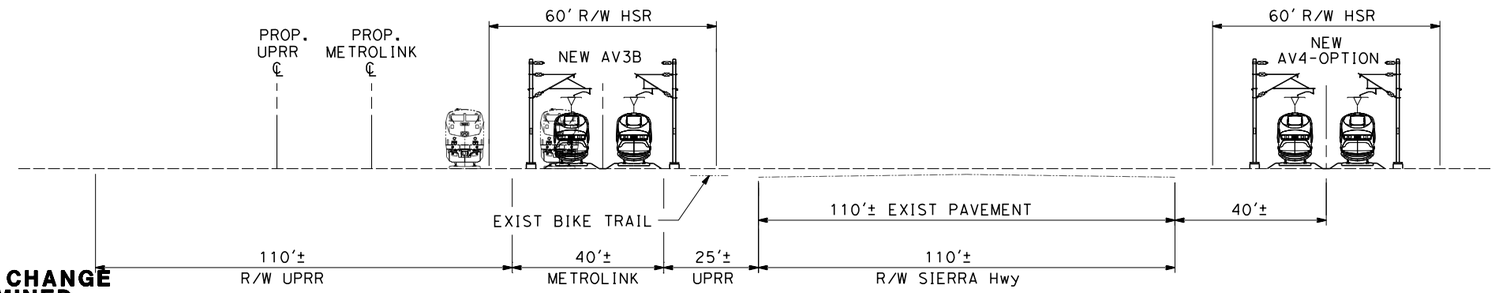
1. RELOCATION OF SIERRA HIGHWAY VARIES PER AV OPTION AND IS NOT SHOWN ON THESE SECTIONS.

SECTION P-P



SECTION Q-Q

SECTION R-R



SECTION S-S

20 0 20 40
1"=20'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V.O./D.B.
CHECKED BY C. RAMIREZ
IN CHARGE O. EARLE
DATE 07/26/11

URS | HMM | ARUP
CALIFORNIA HIGH-SPEED TRAIN

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
CROSS SECTIONS
DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C3012
SCALE AS SHOWN
SHEET NO. 51 OF 51

MOR53804 7/28/2011 5:54:53 PM G:_Sacramento\URS\235413 CA HSR Fresno Palmdale\16.0 Drawings\A-Bakersfield to Palmdale\BP-C-3012.dgn

Appendix D –Tie-ins to Palmdale to Los Angeles Section

The following drawings reflect conceptual alignments of the tie-ins between the Bakersfield to Palmdale Section and the Palmdale Station locations. The drawings illustrate the proposed alignments continuing south of Avenue M, located outside of the Bakersfield to Palmdale Section Supplemental AA study area. These drawings are provided for informational purposes only. Additional studies would be carried out at a later date.

MATCHLINE - SEE SHEET C1035

MATCHLINE - SEE SHEET C2001

CITY OF LANCASTER
CITY OF PALMDALE

PLANT-42
AIRPORT

ALTERNATIVE NEW AV3B

ALTERNATIVE NEW AV3B
TIE-IN TO SR-14 EAST STATION

ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 EAST STATION

UPRR

LOCKHEAD WAY

CHAPMAN UNIVERSITY

SIERRA Hwy

3RD ST E

AVE N-4

W AVENUE M

W AVENUE N

W AVENUE O

E AVENUE P

ALTERNATIVE NEW
AV4-OPTION

ALTERNATIVE NEW AV3B
TIE-IN TO SR-14 WEST STATION

ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 WEST STATION

SR-14 WEST
STATION PLATFORM

PALMDALE

TS 11781+86.46
TS 11777+72.88
SC 11790+72.88
SC 11799+06.77
TS 11827+36.04
CS 11839+24.77
SC 11840+36.04
CS 11846+57.81
CS 11850+54.25
SS 11859+87.45
ST 11874+17.05
CS 11879+97.66
ST 11863+54.25
ST 11892+04.66

11750+00
11800+00
11850+00
11900+00

LEGEND:
MILITARY LAND
UPRR ROW
METRO LINK ROW

PLAN

PVT 11750+66.69
Elev 2535.60'
PVT 11759+97.43
Elev 2537.90'
PVC 11761+62.13
Elev 2540.42'
PVC 11767+64.11
Elev 2540.42'
PVI 11767+62.13
Elev 2545.80'
VC=1200'
PVT 11773+62.13
Elev 2549.72'
PVI 11773+64.11
Elev 2545.80'
VC=1200'
PVT 11779+64.11
Elev 2549.72'

ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 WEST STATION

ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 EAST STATION

ALTERNATIVE NEW AV3B
TIE-IN TO SR-14 WEST STATION

ALTERNATIVE NEW AV3B
TIE-IN TO SR-14 EAST STATION

OG (ALTERNATIVE NEW AV3B TIE-IN
TO SR-14 WEST STATION)

OG (ALTERNATIVE NEW AV3B TIE-IN
TO SR-14 EAST STATION)

L=12967'
0.70%

L=9820'
0.65%

L=12638'
0.70%

L=9820'
0.65%

OG (ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 EAST STATION)

OG (ALTERNATIVE NEW AV4-OPTION
TIE-IN TO SR-14 WEST STATION)

ALTERNATIVE NEW AV3B
TIE-IN TO SR-14 WEST STATION

OG (ALTERNATIVE NEW AV3B TIE-IN
TO SR-14 WEST STATION

PVC 11871+81.65
Elev 2613.87'
PVI 11876+81.65
Elev 2617.13'
VC=1000'
PVC 11880+33.27
Elev 2626.40'
PVT 11881+81.65
Elev 2618.38'
PVI 11884+23.27
Elev 2629.13'
VC= 780'
PVC 11886+35.25
Elev 2626.40'
PVT 11888+13.27
Elev 2630.11'
PVI 11890+25.25
Elev 2629.13'
VC=780'
PVT 11894+15.25
Elev 2630.11'
L=1546'
0.25%

PVC 11877+83.63
Elev 2613.87'
PVI 11882+83.63
Elev 2617.13'
VC=1000'
PVT 11887+83.63
Elev 2618.38'

2800
2750
2700
2650
2600
2550
2500
2450

11750+00
11800+00
11850+00
11900+00

PROFILE

100 0 100 200
VER. 1"=100'

500 0 500 1000
HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE M. WEISMAN
DATE 10/14/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

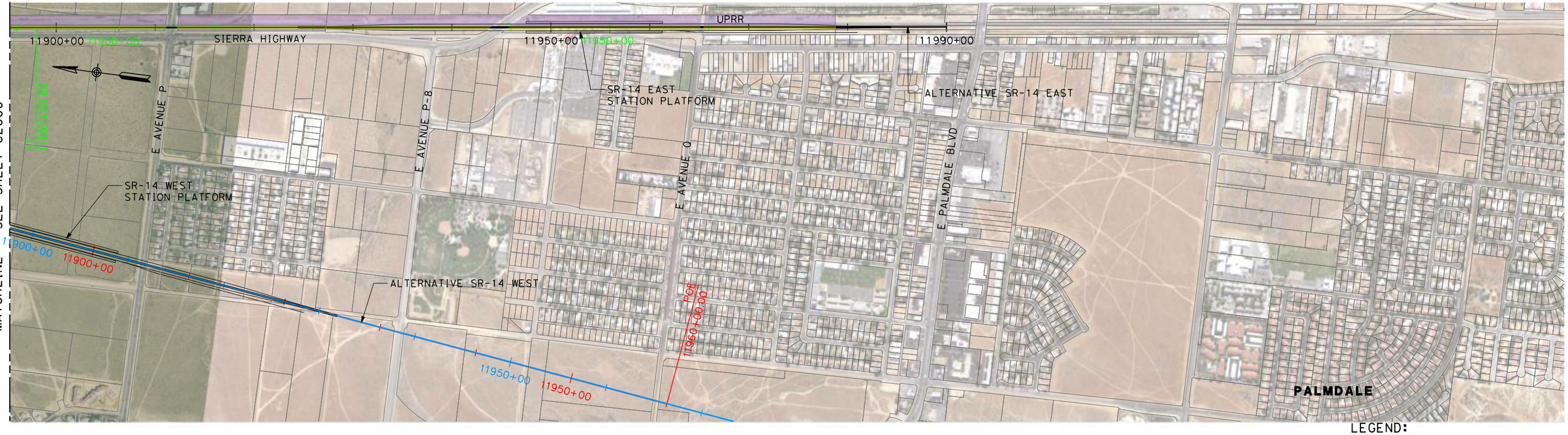
CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE
ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
TIE-INS TO SR-14 WEST & SR-14 EAST
STA 11750+00 TO 11900+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C2000
SCALE AS SHOWN
SHEET NO. 1 OF 2

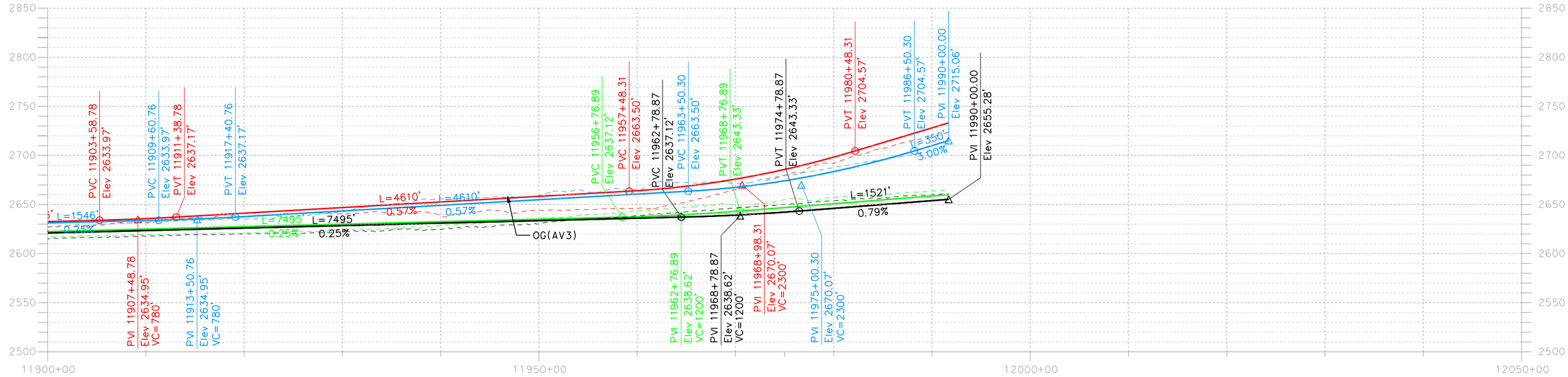
10/14/2011 2:07:33 PM $FILEL$
MOR53804

MATCHLINE - SEE SHEET C2000



LEGEND:
- MILITARY LAND
- UPRR ROW
- METRO LINK ROW

PLAN



PROFILE

VER. 1"=100'

HOR. 1"=500'

PRELIMINARY DRAFT/SUBJECT TO CHANGE
HST ALIGNMENT IS NOT DETERMINED

REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MORENO
DRAWN BY V. ORTEGA
CHECKED BY C. RAMIREZ
IN CHARGE M. WEISMAN
DATE 10/14/11

URS | HMM | ARUP
California High-Speed Train

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
BAKERSFIELD TO PALMDALE

ALIGNMENT STUDY
ALTERNATIVES NEW AV3B & NEW AV4-OPTION
TIE-INS TO SR-14 WEST & SR-14 EAST
STA 11900+00 TO 11990+00

DRAFT

CONTRACT NO. HSR 06-0003
DRAWING NO. C2001
SCALE AS SHOWN
SHEET NO. 2 OF 2

10/14/2011 2:04:43 PM $FILEL$
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